NUTRITION LABELING PRACTICES AND ATTITUDES OF DIETITIANS IN MANAGEMENT

By

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CHAPTER I

INTRODUCTION

> Government recognition and concern for human nutrition was first indicated when appropriations were made in 1894 to the United States Department of Agriculture (USDA) to support investigations of food and nutrition in man (Shank, 1980, p. 5).

It is generally recognized that this interest was brought about by Atwater, who ". . . first compiled and evaluated data on the nutritive value of foods in the USDA" (Hegsted, 1979, p. iii).

Consumers' request for government food regulations, however, did not begin until their awareness concerning food safety standards was heightened, in the early 1900s. This awareness resulted from the various influences of journalism and research. Sinclair's (1906) The Jungle, which questioned the level of sanitation in meat and other food processing plants, the discovery of vitamins, and the role of bacteria in disease, are notable examples.

Subsequently, Congress instituted the first U.S. Federal food laws in 1906. The Food and Drug Act, often called the "Wiley Act", established the Food and Drug Administration (FDA). The Federal Meat Inspection Act was also passed by Congress in 1906, and both acts were originally enforced by the USDA (Hinich, 1978). These initial regulations were aimed at improving safety and preventing adulteration and misbranding. Presently, the FDA administers the Federal Food, Drug, and Cosmetic Act (FD&C Act) and the USDA administers the Federal Meat

Inspection Act, the Poultry Products Inspection Act, and the Egg Products Inspection Act (U.S. Government Manual, 1981/82).

In 1938, the regulation of food claims was divided between the Federal Trade Commission (FTC) and FDA. Congress amended the FTC Act with the "Wheeler-Lea Act", which gave the FTC explicit authority to regulate food advertising. The FD&C Act, also referred to as the "Copeland Act" for Senator Copeland who introduced it, was passed by Congress that same year (Catalog of Public Documents, 1942). The FD&C Act authorized the FDA to regulate food labeling and strengthened FDA's powers to control both drugs and foods. It enabled them to actually inspect processing plants rather than settle for just sampling the finished product(s), and authorized them to promulgate standards of identity, quality, and container measures. (These rules are often referred to as "recipe standards".)

Food labeling remained exceptionally stable until the 1969 White House Conference on Food, Nutrition, and Health (1969 White House Conference, 1970). The full conference of over 3,000 persons provided thousands of recommendations. Emphasized was the desirability of more product information directed to the public by government and industry, while also improving the adequacy, quality, and safety of the food supply. Simplification of legislation, development of large scale nutrition information campaign through improved use of the mass media, and improvement of the food delivery and distribution system was deemed necessary with the realization that,

> Insufficient data are available to show what nutritional information is significant for the various foods, or what type of nutritional information is meaningful and useful to consumers, or what form of disclosure--by the label, or by the package leaflets, or through a central data bank, or to dietitians and physicians--is most informative . . . (1969 White House Conference, 1970, p. 121).

The panel on food packaging and labeling specifically recommended that,

> Studies should be undertaken to determine whether and to what extent significant and meaningful nutritional information should be made available to the purchasers of packaged foods and how this can be done effectively (1969 White House Conference, 1970, p. 107).

Subsequently, in 1971, the FDA proposed new food regulations. This was the beginning of a complete revision, of the form of food labeling that had basically existed since 1938. "The principal, but not exclusive thrust of these changes, was to implement a broad policy of providing greater information to consumers about the nutritional characteristics of food" (Hutt and Sloan, 1979, p.1).

Initial activities by the FDA were directed toward the development of nutrition labeling which could be evaluated by appropriate consumer testing (Fed. Reg., 1972). Based upon the results of this research and on 2,863 comments received from individual consumers, consumer groups and dietetic associations, professionals, representatives of governmental agencies, food manufacturers and distributors, and trade associations, the FDA proposed a new section on nutrition labeling under Title 21 of the U.S. Code of Federal Regulations (CFR) in 1972. This nutrition labeling plan was modified and published as a final regulation in 1973 (Fed. Reg., 1973a).

> The net result of these regulations was that every food label in the U.S. was required to be revised after a suitable period for using up inventories of old labels and phasing in new supplies. These provisions generally became effective in mid-1975 (Hutt and Sloan, 1979, p. 2).

By 1978, the USDA and FTC had joined the FDA in its efforts; their united goal was to develop an overall labeling strategy that would provide consumers with the information they wanted and needed about foods (Fed. Reg., 1980). The agencies realized that,

> Each agency has gone its own way in attempting to respond to consumer needs. The result has been a tangle of duplication and inconsistency . . . . The lack of coordination among USDA, FDA, and FTC has resulted in some important gaps in the label information now available to consumers, as well as some holes in legal authority (Foreman, 1979, p. 1).

The agencies were committed to obtaining full public participation in the consideration and development of new or revised food labeling laws and regulations. They reviewed current regulations and solicited the views of the public on various food labeling issues by holding a series of public hearings and asking for written comments (Fed. Reg., 1980). The FDA also conducted numerous consumer surveys in an attempt to determine their views on specific aspects of food labeling (Heimbach and Stokes, 1979, 1981; Stokes and Haddock, 1972; U. S. Dept. of Health, Educ., and Welfare (U.S. DHEW), 1973-74, 1975, 1979).

The next question they began to search for answers to was how to communicate nutrition and ingredient information. To answer this question, the FDA and USDA are currently working with contracted professional communications experts in the private sector to design and test alternative labeling formats (Stokes, 1981). Thus, the testing continues. As the agencies receive more and more information from interested groups and from self-initiated studies, they continue to implement food labeling revisions in accordance with their respective authorities and procedures.

Government agencies, nutrition professionals, food manufacturers and consumer groups had conducted numerous studies involving the significance of nutrition labeling on consumers' buying habits, consumers' ability to understand and utilize nutrtion labeling information, and consumers' preferences as to nutrition labeling formats. Nevertheless, a significant void remained in the area of evaluating the buying habits,

utilization of nutrition labeling information, and labeling format preferences of nutrition professionals, who procure large quantities of food for consumers. Thus, the researcher believed that a study of the nutrition labeling practices and attitudes of dietitians in management provided the heretofore untapped knowledge/education desired, and best determined what, when, where, how, and why nutrition labeling information was used.

Purpose and Objectives

The purpose of this study was to assess what nutrition labeling information dietitians in management utilize most effectively, when and where this information was most useful to them, why this information was important to them, and how this information influenced their professional practices and attitudes. Members of the American Dietetic Association (ADA), who belonged to the Division of Management Practices, were invited to participate in this study.

The following objectives were identified as guides for this research project.

1. To evaluate the importance that dietitians in management assign to various nutrients, which are possible components of labeling information, as associated with personal and institutional variables.
2. To identify at what point in the meal planning, procurement and food production cycle dietitians in management utilize nutrition labeling information, as associated with personal and institutional variables.
3. To determine which mode of presentation dietitians in

management prefer for nutrition labeling information formats, as associated with personal and institutional variables.

4. To evaluate the order of importance that dietitians in management assign to various diet-related health problems, and determine if these values should be applied to nutrition labeling information, as associated with personal and institutional variables.
5. To determine the goals of nutrition labeling, as perceived by dietitians in management, as associated with personal and institutional variables.
6. To determine if relationship(s) exist between the nutrient information valued by dietitians in management and their concerns with diet-related health problems.
7. To determine if relationship(s) exist between the actual utilization of nutrition labeling information by dietitians in management and their perceived goals for nutrition labeling.
8. To make recommendations for further research based upon the findings of this study.

Hypotheses

The following hypotheses were postulated for this study.

H_1: There will be no significant difference in the values assigned to specified nutrients by dietitians in management as associated with selected personal and institutional attributes.

H_2: There will be no significant difference in the times during the meal planning, procurement, and food production that dietitians in management utilize nutrition labeling information as associated with selected personal and institutional attributes.

H_3: There will be no significant difference in the nutrition labeling information format preferences of dietitians in management as associated with selected personal and institutional attributes.

H_4: There will be no significant difference in the valuation of various diet-related health problems, and their application to nutrition labeling information of dietitians in management as associated with selected personal and institutional attributes.

H_5: There will be no significant difference in nutrition labeling goals of dietitians in management as associated with selected personal and institutional attributes.

H_6: There will be no significant relationship between the values assigned to specified nutrients and those assigned to various diet-related health problems.

H_7: There will be no significant relationship in the actual utilization of nutrition labeling information by dietitians in management and their perceived goals for nutrition labeling.

Assumptions and Limitations

It was assumed that, ". . . even though the opinionnaire provides for anonymous response, there is a possibility that an individual may answer according to what he thinks that he should feel, rather than how he really feels" (Best, 1977, p. 177). This tendency might be escalated by the fact that the survey was sent out under the auspices of the Oklahoma State University Food, Nutrition, and Institution Administration Department - impelling the research subject to answer what they think would be expected of them professionally, and not their actual attitudes and practices. It was also assumed that the research population, consisting of those ADA members who have paid dues, to belong to a specific practice group, represented a normal distribution of all U.S. dietitians in management. The survey is limited by its total sample size and time frame. These factors could contribute to bias(es) in the results.

The researcher was also limited by the fact that there was no way to insure that selected members of the management practice groups actually worked in professional situations, falling within the normal job descriptions of members. Several surveys were, consequently, returned unanswered because they did not apply to those subjects.

Definitions

The following definitions were utilized within this study:

Analytical Unit - The portion(s) of food taken from a subsample of a sample for the purpose of analysis (GSA, 1981a, p. 51).

> Bioavailability of a Nutrient - Refers to the degree that a nutrient, once consumed, becomes available to and usable by the body - depends on type of food providing the nutrient and the overall composition of the diet (Staats, 1980, p. 29).

> Caloric Content - Per serving (portion), expressed to the nearest 2-calorie increment up to and including 20 calories, 5-calorie increment above 20 calories and up to and including 50 calories, and 10-calorie increment above 50 calories. Caloric content shall be determined by the Atwater method as described in Merril and Walt, 'Energy Value of Foods - Basis and Derivation,' USDA Handbook 74, 1955. Caloric content may be calculated on the basis of 4, 4, and 9 calories per gram for protein, carbohydrate, and fat, respectively, unless the use of these values gives a caloric value more than 20 percent greater than the caloric value obtained when using the more accurate values determined by use of the Atwater method (GSA, 1981a, p. 18).

> Carbohydrate Content - A statement of the number of grams of carbohydrate in a serving (portion) expressed to the nearest gram except that if a serving (portion) contains less than one gram, the statement 'Contains less than one gram' or 'less than one gram' may be used as an alternative (GSA, 1981a pp. 18-19.

> Cholesterol Content - Information included on the label in the following order: cholesterol content, stated to the nearest 5-milligram increment per serving and per 100 grams of the food. The following statement shall also be displayed on the label: 'Information (or 'this information') on cholesterol

(and/or fat, where appropriate) content is provided for individuals who, on the advice of a physician are modifying their dietary intake of cholesterol (and/or fat, where appropriate)' (GSA, 1981a, p. 32).

Common or Usual Name of a Food - May be a coined term, shall accurately identify or describe, in as simple and direct terms as possible, the basic nature of the food or its characterizing properties or ingredients. The name shall be uniform among all identical or similar products and may not be confusingly similar to the name of any other food that is not reasonaby encompassed within the same name (GSA, 1981a, p. 43).

Competitive Foods - Non-nutritious food products for sale through vending machines or other vendors in competition with food products served in schools under the National School Lunch and School Breakfast Programs (Hutt, 1981, p. 85).

Fat Content - A statement of the number of grams of fat in a serving (portion) expressed to the nearest gram, except that if a serving (portion) contains less than one gram, the statement 'Contains less than one gram' or 'less than one gram' may be used as an alternative (GSA, 1981a, p. 19).

Fatty Acid Composition - This information may be included on a food label or labeling if: the food contains 10 percent or more fat on a dry weight basis and not less than two grams of fat in an average serving. The following information is required: total fat content in terms of the percent of the total calories in the food provided by the fat, with the heading 'Percent of calories from fat.' The amount of fatty acids, calculated as the triglycerides, shall be stated in grams per serving to the nearest gram in the following two categories, stated with the following headings, in the following order, and displayed in equal prominence: (a) cis, cis-methylene - interrupted polyunsaturated fatty acids, stated as 'Polyunsaturated'; (b) the sum of lauric, myristic, palmatic, and stearic acids, stated as 'Saturated'. The following statement shall also be displayed on the label: 'Information (or 'this information') on fat (and/or cholesterol, where appropriate) content is provided for individuals who, on the advice of a physician, are modifying their dietary intake of fat (and/or cholesterol, where appropriate)' (GSA, 1981a, p. 32).

Federal Register (Fed. Reg.) - Publishes all proposed and final regulations, notices of intended rulemaking and public meetings, executive orders, program deadlines, reorganization plans, and other legal documents of the executive branch since the Administrative Procedures Act of 1946 (Conroy, in press).

Formulated or Fabricated Food - Products made from ingredients not characteristic of the product type, or from ingredients

not commonly found in the home. Most fabricated foods are analogs of basic or traditional foods (Dickinson and Thompson, 1980, p. 24).

Information Panel - As it applies to packaged food, means that part of the label immediately contiguous and to the right of the principle display panel, as observed by the individual facing the principle display panel (GSA, 1981a, p. 10).

Index of Nutritional Quality (INQ) - The ratio between the percent U.S. RDA of a nutrient in the food and the percent daily allowance of calories (Sorenson and Hansen, 1975, p. 53).

Label - A display of written, printed, or graphic matter upon the immediate container (not including package liners) of any article (S. 1651, 1980, p. 198).

Labeling - All labels and other written, printed, or graphic matter: (a) upon any article or any of its containers or wrappers; (b) accompanying such article; or (c) displayed at point of purchase of such article (S. 1651, 1980, p. 198).

Lot - For purposes of determining quality factors related to manufacture, processing, or packing, a collection of primary containers or units of the same size, type, and style produced under conditions as nearly uniform as possible and usually designated by a common container code or marking, a day's production (GSA, 1981a, p. 50).

Medical Foods - Specialized food products available for medical conditions, and for use only under medical supervision (Fed. Reg., 1979, pp. 76006-76007).

Nutrient Density - A food's nutrient content in relation to its energy value (Sorenson and Hansen, 1975, p. 53).

Nutritional Quality Guidelines for Foods - Prescribes the minimum level or range of nutrient composition (nutritional quality) appropriate for a given class of food (GSA, 1981a, p. 54).

Percentage of U.S. Recommended Daily Allowances (U.S. RDA) - A statement of the amount per serving (portion) of the protein, vitamins, and minerals, as described: the percentages shall be expressed in 2-percent increment up to and including

the 10-percent level, 5-percent increments above 10 percent and up to and including the 50-percent level, and 10-percent increments above the 50-percent level. Nutrients present in amounts less than 2 percent of the U.S. RDA may be indicated by a zero, or by an asterisk referring to another asterisk placed at the bottom of the table and followed by the statement 'Contains less than 2 percent of the U.S. RDA of this (these) nutrient (nutrients).' However, when a product contains less than 2 percent of the U.S. RDA for each of five or more of the eight mandatory nutrients (vitamins and minerals), the manufacturer or distributor may choose to declare no more than three of those nutrients and none of the remaining (optional) nutrients (GSA, 1981a, p. 19).

Portion - The amount of a food customarily used in a serving of a meal component of which it is an ingredient (GSA, 1981a, p. 18).

Protein Content - A statement of the number of grams of protein in a serving (portion), expressed to the nearest gram except that if a serving (portion) contains less than one gram, the statement 'Contains less than one gram' or 'less than one gram' may be used as an alternative. Protein content may be calculated on the basis of the factor of 6.25 times the nitrogen content of the food, as determined by the appropriate method of analysis of the Association of Official Analytical Chemists (AOAC), 12th ed., 1975, except when the official procedure for a specific food requires another factor (GSA, 1981a, p. 18).

Recommended Dietary Allowances (RDAs) - The amounts of essential nutrients considered, on the basis of available scientific knowledge, adequate to meet the known nutritional needs of practically all healthy persons in the U.S. (Staats, 1978b, p. 1).

Sample - Consists of 10 subsamples (consumer units) taken one from each of 10 different randomly chosen shipping cases, to be representative of a given lot, unless otherwise specified in a specific quality standard (GSA, 1981a, p. 51).

Serving - That reasonable quantity of food suited for or practicable of consumption as part of a meal by an adult male engaged in light physical activity, or by an infant or child under four years of age when the article purports or is represented to be for consumption by an infant or child under four years of age (GSA, 1981a, pp. 17-18).

Sodium Content - Statement of the number of milligrams of sodium in 100 grams of the food, and in a specified serving of the food. The number of milligrams of sodium shall be declared as the nearest multiple of 5 milligrams, as determined by appropriate analysis, except that, if such food contains not more than 10 milligrams of sodium in 100 grams of

> the food, and/or in a specified serving of the food - the label shall bear a statement to that effect (GSA, 1981a, p. 63).

> Standard of Identity - Includes a definition of the product, a designation of its common or usual name, a list of mandatory and optional ingredients, and amounts or proportions of such ingredients which must, or may be present. It might also specify a production method (U.S. DHEW, USDA, and FTC, 1979, p. 83).

Standardized Foods - Foods whose ingredient composition are legally standardized by the FDA (Lachance, 1973, p. 18).

Trade Regulation Rules (TRRs) - Regulations promulgated by the FTC to establish binding legal requirements, as authoritated by the 1975 FTC Improvement Act (Hutt, 1981, p. 78).

> U.S. Code of Federal Regulations (CFR) - A codification of the general and permanent rules published in the Federal Register, by the Executive departments and agencies of the Federal Government. The Code is divided into 50 titles, which represent broad areas subject to Federal regulation. Each title is divided into chapters, which usually bear the name of the issuing agency. Each chapter is further subdivided into parts covering specific regulatory areas (21 CFR, parts 100-169 covers food and drugs) (GSA, 1981a, p. v).

CHAPTER II

REVIEW OF LITERATURE

A large share of our nation's health costs has been attributed to hunger and poor eating habits. It has also been determined that a primary cause of poor nutrition is lack of consumer knowledge about the proper selection and preparation of food (Staats, 1978a). Nevertheless, a 1980 Government Accounting Office (GAO) report communicated the belief that the Federal agencies' proposed food-labeling regulations should not be implemented at this time because the regulations could result in information being placed on food labels that is not needed, used, or understood by most consumers (Ahart, 1980). There is an urgent need, therefore, for research data on the nutrition labeling practices and attitudes of knowledgeable, professional procurers.

Historical Perspective of Nutrition Labeling Information

Developing Awareness and Need for Government Assistance

Consumer and government awareness, of the direct implications that food and health had on one another, was increased during the World War I years. The focus of attention was influenced by the realization that a number of physical conditions, responsible for many young Americans' rejection in Selective Service examinations, was attributed to causes

that might have been prevented, or corrected, by proper nutrition throughout their growth and development (Egan, 1974).

The war was followed by a serious economic depression, accompanied by periods of drought in the midwest, during the 1930s. Both events seriously threatened the adequacy of the nation's food supply. Thus, public opinion began to support an increased government role in consumer affairs (Egan, 1974).

Special Dietary Food Regulations and Minimum Daily Requirements

To keep pace with the continually expanding knowledge of human nutrition, child growth and development, disease prevention, scientific agriculture, and developments in food technology, the FDA promulgated the first regulations controlling nutrients in foods for special dietary uses, in 1940. These regulations governed the labeling of any food, including vitamin-mineral products, for which any special dietary property was claimed, and had been generally recommended by dietititans. The medical profession had also requested fat labeling, as an aid to persons on modified fat diets. This recommendation, however, met with less success (Fed. Reg., 1972).

The FDA regulations concomitantly established Minimum Daily Requirements (MDRs) for ten vitamins and minerals. Included were: Vitamin A, Vitamin D, Niacin, Vitamin B_1, Vitamin B_2, Vitamin C, Iron, Calcium, Phosphorous, and Iodine. The MDRs were used widely as standards in the labeling of billions of vitamin and/or mineral preparations and foods until the early 1970s. Prior to these recommendations/ regulations, little had been done on evaluating nutrition labeling as a

means of consumer education and information on nutrition and good diet (Lachance, 1973).

Recommended Dietary Allowances Established

The forties also brought World War II and the release of the first Recommended Dietary Allowances (RDAs) in 1943, by the Committee on Dietary Allowances of the Food and Nutrition Board (FNB) of the National Research Council (NRC), National Academy of Sciences (NAS). Initially intended as a ". . . guide for planning and procuring food supplies for national defense" (NAS, 1980, p. v), the RDAs had since been utilized

> . . . as guides for planning and procuring food supplies for population groups, interpreting food consumption records, establishing standards for food assistance programs, evaluating the adequacy of food supplies in meeting national nutritional needs, developing nutrition education programs, developing new products by industry, and establishing guidelines for nutritional labeling of foods (Staats, 1978b, p. 3).

Subsequently, the problems that came about from the use(s) of the RDAs were ". . . related to their application to the diets of individuals rather than to groups or to conclusions that diets are necessarily inadequate when nutrient intakes are less than the RDA" (Shank, 1980, p. 7). These were unanticipated uses of the RDAs when they were originally conceived.

Hearings on Special Dietary Foods

"Over the years, the RDAs have been systematically upgraded and expanded to reflect new knowledge, whereas the FDA-MDRs have remained stagnant and increasingly less relevant" (Lachance, 1973, p. 19). Consequently, a total revision of all the FDA's special dietary regulations was begun by the agency in the early 1960s. Since the FD&C Act requires

a formal evidentiary hearing before any such regulation(s) are promulgated, the FDA held trial-type hearings on Special Dietary Foods from 1968-1969. The regulations were subsequently broken into several parts and promulgated seriatim.

> Most of those regulations, governing such matters as hypoallergenic food, infant food, low sodium food, and most recently diet food, have been accepted without court challenge. The provisions relating to vitamin-mineral products, however, have been the subject of repeated court challenge and special congressional legislation (Hutt and Sloan, 1979, p. 1).

Comprehensive final regulations controlling vitamin-mineral products had still not been promulgated to date.

Establishment of the U. S. RDAs

A consensus resulted from the Special Dietary Hearings and the 1969 White House Conference ". . . that the Government needed a more effective means of initiating regulatory changes than by having to resort to adversary proceedings that could drag out for years" (Lachance, 1973, p. 19). Thus, to implement the provisions of the new regulations governing nutritional labeling for food and the new regulations relevant to dietary supplements, vitamins, and minerals, the FDA established U.S. RDAs for protein and 19 vitamins and minerals essential for human nutrition. The U.S. RDAs replaced the MDRs and were to serve as a basis for nutritional labeling requirements, labeling foods for special dietary use, and standards of identity for dietary supplements (Staats, 1978b). Unlike the MDRs, which represented the minimum amount of a vitamin or mineral to maintain health,

> . . . the U.S. RDA values were derived from the highest values for each nutrient in the NAS/NRC RDA for males and non-pregnant, non lactating females, 4 or more years of age, except for a compromise at 1.0 grams for calcium and phosphorous values (Lachance, 1973, p. 19).

Uses of the U.S. RDAs

The U.S. RDA values served as the basis for the nutrient standard developed to govern dietary supplements of vitamins and minerals. The lower limit for adults was 50 percent of the U.S. RDA and the upper limit was 150 percent of the U.S. RDA. "The concept of 50%-150% U.S. RDA has important legal ramifications because it is the essential basis used for distinguishing between food nutrients, nutrient supplements, and nutrients as drugs" (Lachance, 1973, p. 19).

> If any vitamin or mineral is added to a food so that a single serving provides 50 percent or more of the U.S. RDA for adults and children 4 years or more of age . . . of any one of the added vitamins and/or minerals, unless such addition is permitted or required in other regulations, e.g., a standard of identity or nutritional quality guideline, or as otherwise exempted by the Commissioner, the food shall be considered a food for special dietary use (GSA, 1981a, p. 17).

A food product with a nutrient present in levels above 150 percent of the U.S. RDA was considered a drug. Exceptions to this were food(s):

> . . . represented solely for the dietary management of specific diseases and disorders (e.g., chemically defined elemental diets) will be permitted, for now, to contain nutrients in excess of the 150% U.S. RDA without being classed as a drug. These products are considered 'medical foods' and separate regulations will eventually be issued for such products (Lachance, 1973, p. 19).

Drawbacks of the U.S. RDAs

One took into consideration that the U.S. RDAs differed from the NAS/NRC RDA in that their values were not changed as new RDAs were published. Based on the 1968 RDA values, the U.S. RDAs were not changed in 1974, ". . . because changes from the 1968 RDAs were only reductions in values and not considered of health significance by the FDA" (Staats, 1978b, p. 50). A new revision of the U.S. RDAs was predicted by Staats

after the release of the 1979 RDAs - to reflect the changes and included those nutrients for which provisional recommended allowances were established. This revision, however, was not taken place as of yet.

Another drawback, claimed by Lachance (1973), was that:

> . . . dietitians and home economists aren't going to find nutrition labeling very helpful in menu-planning, in fact it will almost be impossible because . . . the U.S. RDA . . . based on maximum values . . . [will make it] difficult to plan a balanced U.S. RDA menu using commodity foods without the total number of accompanying calories being excessive for the average semi-sedentary person (p. 21).

Education of the Public

Dietary Guidelines

It was acknowledged that implementation of U.S. RDAs, through dietary guidelines, would prove to be of very little use to the public, if they did not possess the ability to interpret or apply the concepts to meal planning and procurement of foods. Thus, the USDA assumed responsibility for this function in 1943. Following the initial release of the RDAs, which originally included food guides and menus, the USDA developed a pamphlet that introduced the concept and use of the "Basic Seven Food Groups." The focal point stressed was on obtaining a nutritionally adequate diet through selection of a variety of foods (USDA, 1943). In 1956, this approach was reorganized and streamlined which led to the establishment of the "Basic Four Food Groups" (USDA, 1957).

> The major goals of these first efforts to provide dietary advice for the public welfare were to allow for optimal growth and development in childhood, most favorable outcome of pregnancy, avoidance of obesity, and prevention of nutritional deficiency disorders (Shank, 1980, p. 11).

In 1961, however, the American Heart Association (AHA) became concerned about the increasing number of deaths due to coronary heart

disease (CHD). The association advised the public to recognize three factors contributing to the risks of a heart attack. These risks were high blood pressure, cigarette smoking, and increased levels of cholesterol in the blood serum (Shank, 1980). To this day, the question of cholesterol intake and its actual affect on increasing the chances of developing CHD had been debated.

Catalyzing the debates for the past 20 years were the differing guidelines that have been issued to the public (Diet and CHD, 1972; U.S. Senate, 1977, 1978; USDA, 1980; NAS, NRC, FNB, 1980). Of these guidelines, the "Dietary Goals for the United States," published by Senator George McGovern's Senate Select Committee on Nutrition and Human Health, deserved special notice. Unlike earlier guidelines, their focus was on the prevention and control of a variety of chronic diseases, rather than avoidance of under- or over-consumption. These seven goals were also credited for broadening acceptance of the need for a national nutrition policy (Shank, 1980).

Consumers' Lifestyles Change

Due to World War II, there were significant changes in family life, especially with more women entering the labor force. The food stamp plan and school lunch program, both initiated in the late 1930s, were affected by the war also. Due to food shortages, shortages of personnel and full employment, the food stamp program was discontinued. The school lunch program was established on a continuing basis when the National School Lunch Act was approved June 4, 1946 (Egan, 1974).

The 1950s saw a revolution in agriculture productivity, resulting in mounting surpluses - a problem previously unknown. Food science and

technological developments, along with improvements in transportation and communications, introduced many new food products to people. These developments, along with the ever-growing number of women who where working outside of the home, caused food consumption patterns to change.

The incidence of vitamin deficiency diseases had begun to decline soon after the national program for enrichment of white bread in 1941. Thus, consumer and government awareness focused on totally new areas of concern that dealt with over-consumption (obesity), degenerative diseases, and combating food quackery. If nutritional awareness in succeeding generations was to be maintained, the need for a continuous educational effort was also recognized, particularly with school children. This concern was evidenced in numerous national conference recommendations through the mid-fifties (Egan, 1974).

The early 1960s saw the FDA's revision of all its regulations, as food and nutrition issues were catalyzed into the nation's limelight through key, top-level conferences and increasing use of mass media. The First White House Conference on Aging was held in 1961, as well as a conference held on the Role of State Health Departments in Nutrition Research, highlighting the growing concern with degenerative diseases, quality of life in later years, and preventative public health care. Poverty was then rediscovered in America with the 1968 report, "Hunger, U.S.A.", by the Citizens Board of Inquiry Into Hunger and Malnutrition in the United States. The food stamp program was reestablished and the school lunch program was expanded as efforts to improve the diets of the poor. Thus, this controversial decade ended with the 1969 White House Conference on Food, Nutrition, and Health (Egan, 1974).

The 1970s evidenced a population shift caused by a decrease in newborn infants, and a continuing increase in the number of elderly persons. Food prices increased drastically, yet the continually expanding number of processed and formulated foods still managed to account for more than half of the American diet in 1979 (Fed. Reg., 1979). It was becoming increasingly difficult for the growing number of health-conscious consumers to identify the nutritional qualities of the products they purchased.

Nutritional Guidelines and the Labeling of Foods

The hunger exposés of the mid-to late-1960s influenced numerous recommendations of the 1969 White House Conference. Due to one recommendation, that the U.S. food supply should be made complete by fortification, industry and government programs moved toward a combined education-fortification approach (Breeling, 1971).

The FDA contracted with the NAS in 1971, ". . . to obtain the recommendations of a committee appointed by the Academy, as to what classes of foods should have guidelines and what the guideline values should be for the various nutrients" (Breeling, 1971, p. 104). Unlike the enriched flour program, the guidelines program was to be one of guaranteed nutrition rather than nutritional supplementation. Since first preference was to be given to reaching specified levels with natural foods, not by supplementation, the FDA hoped to discourage a food industry fortification race (Breeling, 1971). To date,

> The FDA has issued only one nutrition quality guideline, for 'heat and serve' dinners . . . proposed guidelines for breakfast products . . . fortified ready-to-eat breakfast cereals . . . and main dish products . . . [have been] in abeyance pending adoption of the final food fortification policy that was published in 45, Fed. Reg., 6314, January 15, 1980. It

> is unclear whether FDA will now allocate the resources necessary to take final action on these proposals (Hutt, 1981, pp. 75-76.

Traditional approaches to nutrition education needed to be reevaluated because:

> In the past, nutritionists and dietitians could feel reasonably certain that consumers could make the connection between the Basic Four or Basic Seven food groups and the products they saw in the supermarkets. Today, it is much more complicated to place foods in neat groups (Cook, 1971, p. 100).

The FDA, subsequently, began a program to investigate the possibilities of using food labels as the first step of a comprehensive program of nutrition education.

Initial Consumer Studies

Little evaluation had been done prior to the 1969 White House Conference on nutrition labeling as a means of consumer education and information. Neither did any consumer data exist on the format or detail of nutrition labels, or on the food categories to be included.

In 1970, Call of Cornell University conducted a survey of all the members of the American Institute of Nutrition (AIN). Call found that over 80 percent of the professional nutritionists studied thought that more nutrition information should was needed on food labels. In general, the nutritionists had not had a specific preference for systems of listing nutrients, and had been divided on what information and format were to be used. The majority, however, felt that vitamins and minerals should be based on a standard such as the RDA (Call and Hayes, 1970).

Following Call's study, results of another study, in which consumers were exposed to products with full disclosure of nutrition

content, had been released by a trade magazine. The study presented nutrition information for both major and minor nutrients in percentages; calories were also listed. Results indicated that, ". . . the type of full disclosure labeling investigated does have an effect of moving customers in the direction of greater purchasing of the full disclosure brands" (Fed. Reg., 1972, p. 6494).

With the data from these two studies, the FDA began to develop optional drafts for nutrition labeling by June, 1970. These drafts were evaluated for scientific correctness by professional nutritionists affiliated with the American Dietetic Association (ADA), AIN, FNB/NAS and sent to a number of consumer groups, dietitians, food industry associations, home economists, and professional groups. Their comments were received by October, 1970, and along with the information gathered from the few earlier studies, helped to produce the basis for the content and format of nutrition labeling.

Options that were strongly supported and technically feasible were compiled and narrowed down to three alternatives. Across the board it had been determined that agreement had existed for all nutrition information to have been: presented in terms of a portion that was easily measured in a household and identified as a reasonable serving amount; based on the RDAs' inclusive of the amount of caloric content, fat, protein, and carbohydrates present, as well as Vitamin A, Vitamin C, thiamin, riboflavin, niacin, calcium, and iron. It had also been determined that the latter seven nutrients would be expressed as a percentage of the RDA. It was this variable that differed among the three original, FDA labeling formats. The alternatives, that existed for expressing the percentage of the RDA for the seven nutrients, were numerical,

adjectival, and expressed (pictorially or numerically) as units with ten units equal to 100 percent of the RDA (Fed. Reg., 1972).

The FDA then worked with a private nonprofit research group, Consumer Research Institute (CRI), and carried out a study that had been developed to answer these specific questions:

1. Is there strong consumer support to nutrition labeling when examples of labels are actually available for review?

2. What type of labeling format is most acceptable to consumers and results in changing consumer performance?

3. What aspects of nutrition labeling (calories, proteins, fats, carbohydrates, vitamins and minerals) raises maximum consumer response? Is the combination most effective?

4. Do consumers react better to complete listing of nutrients or to a listing which includes only those nutrients present in significant amounts (Fed. Reg., 1972, p. 6494)?

CRI carried out the study to determine consumer understanding and use of the labeling alternatives in two parts. It developed a protocol for studying the three labeling alternatives and started field studies in June, 1971. Assisted by an independent research group, the research was completed in September, 1971. CRI then developed a large consumer questionnaire study sent to:

> . . . three population groups: 2,000 consumers selected to represent the American population (U.S. probability sample), 2,000 consumers identified as low income, and 600 consumers identified as 'under educated' (having no high school education) (Fed. Reg., 1972, p. 6494).

Concomitantly, five food chain stores had expressed interest and agreed to carry out in-store tests which utilized one of the FDA labeling alternatives. The stores evaluated consumer responses, while FDA contracted Call and Padberg of Cornell University, who conducted a formal consumer evaluation in each store. The FDA contract with Cornell was made up of two phases which had been designed to: evaluate consumer

interest in nutrition, and to obtain some estimate of consumer's expressed indirect benefits of nutrition labeling; provide detailed information on the three labeling format alternatives and determine the consumer's understanding of the relationship between nutrition labeling and the development of good diets (Fed. Reg., 1972).

The preliminary results of the first phase of the CRI activities were presented at a public meeting on December 7, 1971. CRI's conclusions were stated as follows:

1. Nutrition information was used by the consumers . . . demonstrated by the fact that their purchase patterns changed after the introduction of nutrient labeling.

2. In situations where a product or brand has a real nutritional advantage over its competitors, there was a major change in that product's share of the market.

3. . . . changes in attitude were positive but small, since the consumers in the test panel already had very positive attitudes about nutrition.

4. There was a considerable increase in the consumers' knowledge of nutrition, especially in their awareness of vitamins and minerals.

5. All three formats for communicating the amount of RDA . . . are understood and used equally well . . . among the educated and affluent in our society.

6. No differences in consumer reaction were found between listing all nutrients and listing only those nutrients present.

7. . . . a listing of protein, fat, and carbohydrates in percent composition is useful to the consumer as was indicated by changes in purchase behavior [by the consumer] (Fed. Reg., 1972, p. 6495).

A preliminary report of the second phase of the CRI studies (on low income and under-educated consumers) was provided to the FDA on February 25, 1972. Of their national sample, over 80 percent were able to perceive differences between products with each of the three RDA formats.

> Expression in numerical percent was preferred by the majority, because it was considered more exact and easier to use. Adjectives were considered vague and confusing, and pictorial units were considered too silly or childish (Fed. Reg., 1972, p. 6495).

The studies also found that:

> The percent of persons making the correct choice and perceiving differences between products was slightly better when the label contained only the nutrients present instead of when all seven nutrients in the labeling format were listed with zero content indicated for those nutrients not in the product (Fed. Reg., 1972, p. 6495).

The preliminary report from the Cornell study ". . . indicated that perception of the labels was correlated to education and income" (Fed. Reg., 1972, p. 6496). In this study, consumers were asked if they felt the following indirect benefits would result from nutrition labeling:

1. Nutrition information for food products will increase consumer confidence in the food industry.
2. If manufacturers have to show nutrition information, they will try harder to make their products nutritious.
3. Nutrition labels encourage advertising that will promote consumer education.
4. More information indicates a greater concern for consumer welfare.
5. Consumers have the right to know the nutrition value of food products on the market (Fed. Reg., 1972, p. 6496).

Results indicated that, of all persons interviewed, 87.9 percent agreed that these indirect benefits would occur with the use of nutrition labeling and 97.6 percent agreed that it was the consumers' right to have nutrition information on food products on the market (Fed. Reg., 1972).

The FDA contracted with Response Analysis Corporation of Princeton, New Jersey in late 1973, to study the ". . . attitudes towards and knowledge about nutrition among chief food shoppers for households in the United States" (U.S. DHEW, 1973-74, p. i). This study had several objectives:

1. Obtain a baseline measure of nutrition knowledge and attitudes among those persons who have primary responsibility for purchasing the food for their households.

2. Develop a system for both initial data collection and subsequent measurement that provides trend information.

3. Develop criteria which can be used as the basis for measuring change over time in the three areas covered:
   -attitudes toward nutrition
   -knowledge about nutrition
   -reactions to nutrition labeling
   (U.S. DHEW, 1973-74, p. i).

The FDA also hoped the research would aid it ". . . in developing and promoting a nutrition education campaign, including a program to introduce the concept and uses of nutrition labeling" (U.S. DHEW, 1973-74, p. i).

The results indicated that those food shoppers with at least some college education placed highest in the measurement of nutrition knowledge and information. Nevertheless, 34 percent considered themselves quite knowledgeable about nutrition, the majority (43 percent) felt they were moderately well informed, and about 22 percent regarded themselves as relatively uninformed about nutrition. The reactions to nutrition labeling included:

1. About half of homemakers (47 percent) say they understand everything on the specimen nutrition label. About the same proportion (51 percent) does not understand some or all of it.

2. Nearly any nutrient information is believed to be important to food shoppers. Of least consequence is label information on serving size and servings per container.

3. The most likely projected benefit of nutrition labeling is seen as helping to provide the family with more nutritious foods (28 percent). Projected as the least likely benefit is that nutrition labeling will increase the homemaker's own knowlege of nutrition (28 percent).

4. A majority of food shoppers: would prefer nutrition labeling (79 percent) to recipes on the label (9

> percent); would prefer nutrition labeling (64 percent) to label information on how to make a balanced meal which includes the food in the container (20 percent); thinks they would use nutrition label information in deciding whether to buy a new brand (75 percent); and believes they will derive 'quite a bit' of benefit from nutrition labels (52 percent) (U. S. DHEW, 1973-74, pp. viii-ix).

FDA Interpretation of Initial Consumer Data

While all the issues associated with nutrition labeling had not been resolved, the FDA commissioner believed that the completed studies had provided the answers to the basic questions. The Commissioner had also deemed it important that a single nutrition labeling guide be established and followed by the food industry in order to avoid consumer confusion and reduction of the potential educational benefits of nutrition labeling. The Commissioner subsequently proposed to establish regulations governing nutrition labeling for packaged food products, based on the following criteria published in the March 30, 1972, Federal Register:

1. Vitamins and minerals should be expressed as a proportion of the RDA modified to provide a single RDA level for all ages and sexes.

2. The labeling should indicate the caloric content and amounts of protein, carbohydrate, and fat in the product.

3. The nutrition content should be related to a portion or serving of the food expressed in common household terms or in easily identified units.

4. A complete listing of the seven important vitamins and minerals should appear on all products unless the product contains essentially none of those vitamins or minerals.

5. A listing of protein content should appear on all products unless the product contains no protein (p. 6496).

The Commissioner had been aware that consumers would expect nutrition labeling to accurately represent the food product(s); he had

also been aware of the fact that sufficient tolerances of variance were necessary for manufacturers to cope with natural nutrient differences, without incurring excess costs for quality control, which would only be passed on to the consumer.

> By using a percentage of the RDA; expressed in increments of 5 to 10 percent, some of the variation in products can be accommodated. In addition, for the purposes of nutrition labeling, the statement will be considered in compliance if at least 80 percent of the product in the package meets or exceeds the claimed nutrient levels, and if no sample of the product will have a nutrient content less than 80 percent of the nutrient claim (Fed. Reg., 1972, p. 6496).

It had also been important that a uniform location for nutrition labeling, and other related information which is not required on the principle display panel, be established. This not only eliminated manufacturers' questions, but made it easier for consumers to locate and use the information, under normal conditions of purchase and use. The Commissioner had defined the information panel as:

> . . . that part of the label immediately to the right of the principle display panel. If the package has alternate display panels the information panel may appear to the right of either. If the top of the container is the principle display panel, and there is no alternate principle display panel, the information panel is any part of the label adjacent to the top (Fed. Reg., 1972, p. 6497).

Further Consumer Labeling Studies

The FDA has studied the official nutrition labeling format, since its conception in 1973, to assess its comprehension, effectiveness as an educational tool, and cost/benefit ratio to U.S. consumers (U.S. DHEW, 1973-74, 1975).

Educating and Retesting the Public

The FDA concluded, from the results of their 1973 food shopper

survey, that a need existed for them to develop educational programs, if nutrition labeling was to achieve any overall positive effect(s). The agency decided to utilize the mass media and began to implement an education program in May 1974. This program had three primary objectives: ". . . to tell consumers that nutrition labeling was available, to tell consumers how to use nutrition labeling, and to stimulate a greater interest in nutrition" (U.S. DHEW, 1974, p. 20). The highlight of this educational effort was, "Read the Label, Set a Better Table", a 14-minute film narrated by Dick Van Dyke, a TV and movie star.

In 1975, the FDA initiated a follow-up study, to their 1973 survey. Once again, the FDA contracted with Response Analysis Corporation, and aimed this second phase at evaluating the impact of the previously mentioned FDA education program. The concurrent introduction of nutrition labeling into the marketplace, and its impact, was also to be measured.

The results indicated little change in the consumers' self-estimate of nutrition knowledge (32 percent "high", 38 percent "moderate", and 26 percent "low") - compared to the 1973 survey results of 34, 43 and 22 percent, respectively. The following differences became apparent though:

1. Younger shoppers (under 50 years old) score higher than older shoppers.
2. Shoppers in the higher socioeconomic groups score highest . . . .
3. Shoppers in the South score lower than those in other regions.
4. Women score higher than men.
5. Blacks score lower than all other respondents grouped together (U.S. DHEW, 1975, p. v).

Results, regarding the issue of nutrition labeling, were as follows:

1. A majority of shoppers (58 percent) say they have noticed food products which have nutrition labeling. A third of all shoppers say they have actually made use of nutrition labeling in making buying decisions . . . .

2. Shoppers are divided on whether they would prefer to use nutrition labeling as a shopping aid . . . or as an aid in planning and evaluating diets at home . . . . Nevertheless, more shoppers (42 percent) say they would prefer help in getting the best nutritional buys than say they would use the information at home (28 percent) . . . .

3. Forty-two percent say they would prefer nutrition label information, but 37 percent pick information on making a well-balanced meal with the food in the package [compared to 64 percent and 20 percent, respectively, in 1973] . . . .

4. Many shoppers (72 percent) say they would make use of nutrition labeling to help decide about buying a new brand for the first time (U.S. DHEW, pp. vii-ix).

An interesting comparison between the two studies (1973-74 and 1975) was the extra amount that consumers were willing to pay for nutritional labeling.

> In 1973, 48 percent of shoppers said they were willing to pay 50 cents extra a week for nutrition labeling, and 25 percent were not willing to pay anything . . . in 1975, 40 percent are willing to pay 50 cents more each week and 34 percent are not willing to pay anything . . . [indicating a] somewhat less favorability toward nutrition labeling since 1973 (U.S. DHEW, 1975, p. ix).

In 1977, the USDA conducted 1,433 interview-surveys, with a national sample of chief food shoppers (major food purchaser in a household). This study focused on different shopping-related behaviors, and found that:

> . . . forty-four percent of shoppers said they always or almost always read nutrition information before purchasing a product for the first time . . . . [and] nutrition labeling is still not used as widely as ingredient information . . . . [however] both nutrition and ingredient information are similarly rated overall and across subgroups in terms of their value . . . . [but] information on open dating is regarded as useful by

> twice as many shoppers as those who feel this way about nutrition information (Schrayer, 1978, p. 45).

Schrayer (1978) summed up the results of the FDA 1973, 1975, and the USDA 1977 surveys by saying that:

> . . . nutrition information is most useful to the very populations who don't need it - the younger, more affluent groups who probably eat pretty well. The older, poorer groups simply don't understand it and don't have enough nutrition knowledge to make use of it" (p. 45).

Proposals for Alternate Formats

Proposals for alternate nutrition labeling formats have included nutrient density bar graphs, that were first proposed as a format for presenting nutrition information ". . . by Mary Swartz Rose in 1927 and by Roger J. Williams in 1946" (Dickinson and Thompson, 1979, p. 26). This format was taken a step further with the Index of Food Quality (IFQ), which is a proposed ". . . quantitative method of defining or describing nutrient density" (Sorenson and Hansen, 1975, p. 53).

Pie chart formats have been proposed that can be used to relate the nutritional value of food products to the nutritional value of an appropriate reference food (Babcock and Murphy, 1973). The pie chart format has also been proposed, using the nutrient density concept, for use in combination with bar graphs (Dickinson and Thompson, 1979), with a tabular format that was devised by the Center for Science in the Public Interest (CSPI) (Brill, 1980), and utilizing the IFQ concept to display micronutrients (Guthrie, 1980).

General Mills conducted its own labeling alternative research with Creative Research Associates, and their conclusions coincided with those of Food Marketing Institute's (FMI) - consumers wanted ". . . clarity,

simplification and a logical progression" applied to the information on food labels (Engstrom, 1980, p. 1). From these consumer requests, General Mills designed a:

> . . . label format using boxes to section off particular groupings of label information . . . [with the] progression of information . . . [going] from the general (ingredients) to the more specific (calories and their sources: protein, carbohydrates, fat) to the most specific (vitamins and minerals) to nutritional information of specific interest (sugar, sodium, fiber, cholesterol). Some products . . . [having] more 'specific interest' boxes than others (Engstrom, 1980, p. 1).

Evaluations of Alternate Formats

Graphical approaches (graphics, colors, charts, etc.) to nutrition labeling were strongly supported, when first suggested, but subsequent studies discovered their lack of acceptance by the public (Hammond, 1978; Stokes and Haddock, 1972).

> Graphs tend to editorialize . . . people in our focus groups were very suspicious of any graphic which reduced nutrient information to a simple form because they feared the method would not reflect their own values and opinions (Hammond, 1978, p. 6).

Mohr, Wyse, and Hansen (1980, p. 168), however, found that, ". . . the nutrient density format would appear to be more effective than the current labeling format as a help to consumers trying to make nutrition decision."

Recent FDA Surveys

In 1978, the FDA's Division of Consumer Studies initiated a comprehensive program of consumer food labeling research. A national survey was developed and conducted by Response Analysis Corporation of Princeton, New Jersey, under contract to the FDA. Survey questions were focused on what information should appear on the food label, as well as

how the information should be presented to maximize consumer comprehension and use. The population consisted of 1,374 consumers, and face-to-face, at-home interviews were used.

> The questionnaire was directed primarily towards five areas: (1) consumer awareness of current label information; (2) problems, difficulties and concerns of consumers with regard to food and food labeling; (3) usage of currently available label information; (4) problems encountered and sources of confusion with current information; (5) needs for additional or revised information (Heimbach and Stokes, 1979, p. 3).

Their conclusions, relating to nutrition labeling, are summarized as follows:

1. Nearly all shoppers are aware of such label information as the ingredient list, the nutrition label, and open dating, but only about 75% pay any attention to any of it.

2. The ingredient list is quite frequently named as one of the most useful sources of information on food labels; the nutrition label (except for calorie information) is rarely cited.

3. A common use of the ingredient list is to help shoppers avoid specific substances; over half of all shoppers report using it for this purpose.

4. Substances most often avoided are sugar (by a fourth of all shoppers), salt, preservatives, fats, and articial colorings.

5. The most frequently offered reason for avoiding these things is fear of adverse health effects . . . .

6. Althought 64% of shoppers report paying attention to nutrition information, it is evident that it is not considered to be nearly as important as ingredient information. One problem is in translating this information into usable or actionable form. In addition, there is little general dissatisfaction or worry about the nutritional value of food.

7. Finally, it is clear that much of the attention paid to food labels is motivated by fear. Shoppers use label information primarily to identify and avoid perceived hazards rather than to seek and obtain benefits (Heimbach and Stokes, 1979, pp. ii-iv).

Tripartite Hearings

In June, 1978, the FDA, USDA, and FTC announced joint hearings and requested written comments by November 10, 1978, on a series of food labeling topics. The public hearings were held in Wichita, Kansas (August 22-23, 1978); Little Rock, Arkansas (September 18-19, 1978); Washington, D.C. (September 27-29, 1978); San Francisco, California (October 12-14, 1978); and Boston, Massachusetts (October 25-26, 1978). The purpose of the request for written comments and public hearings was to elicit the views of individual consumers about what information they wanted or needed on food labels and what additional costs, if any, they would be willing to pay for this information (Fed. Reg., 1978).

Through the agencies' substantial effort to encourage individual consumers to participate in the nutrition labeling review process, more than 2,800 people attended the hearings, 452 individual and group representatives testified, and more than 9,000 written comments were received by the agencies (Fed. Reg., 1979). These comments were reviewed and analyzed by a team of representatives from each of the agencies, that developed a computerized system for analyzing the public's written comments and oral testimony (U.S. DHEW, USDA, and FTC, 1978).

Food Labeling Rationale

> The purpose of nutrition labeling is to provide consumers with information at the points of purchase and use to compare products, to evaluate nutritional claims which have been made for a product, and to prepare a nutritious diet (Fed. Reg., 1973b, p. 6952).

To achieve this purpose, labeling should provide sufficient amounts of utilizable information to enable the consumer to identify foods and

their characteristics.

With these goals in mind, the USDA, FDA, and FTC followed the subsequent principles in their deliberations concerning specific recommendations for food labeling regulation revisions:

1. Public Health Importance . . . . In considering each proposal for changing the way foods are labeled, the agencies considered very seriously its public health implications. They are convinced that in those instances when food labeling is the most effective method for providing health protection (the labeling of a food's sodium content, for example) society will find the additional cost acceptable.

2. The Consumer's Right-to-Know . . . . Acknowledging that food labels play a crucial role in providing the information consumers need to make intelligent choices about foods, and that labels provide a significant educational tool, however, does not mean that food labeling should be either the sole vehicle for educating the public about basic nutrition or the government's only tool for influencing the eating habits of Americans . . . . Responsibility for providing this kind of education does not rest with regulatory agencies alone, for many institutions - both public and private - must cooperate to provide the basis for informed choices about food.

3. Economic Protection . . . . Any requirement intended to prevent economic deception or designed to offer savings to consumers, for example, would be counter-productive if the added labeling cost exceeded the projected savings (Fed. Reg., 1979, p. 75992).

Congressional Action

The first major food labeling bills were introduced in 1970, and numerous food labeling bills have been introduced yearly since then. No incumbent administration has officially introduced any comprehensive food labeling legislation though and, to date, the only food labeling provisions that have been introduced in Congress, on behalf of any administration during the past 20 years, have been concerned with full ingredient labeling (Hutt and Sloan, 1979).

Congressional involvement with nutrition labeling came to the forefront on August 2, 1979, when Senator McGovern introduced two companion bills, S. 1651 and S. 1652, on nutrition labeling and information. McGovern, Chairman of the Subcommittee on Nutrition of the Senate Committee on Agriculture, Nutrition, and Forestry, sponsored these bills along with Senators Riegle, Kennedy, Lugar, Leahy, Williams, Javits, and Metzenbaum (Congressional Record, 1979).

S. 1651, a bill entitled "Department of Agriculture Nutrition Labeling and Information Act of 1979" was referred to McGovern's Committee on Agriculture, Nutrition, and Forestry. It dealt with meat and poultry labeling, which are regulated by the USDA. S. 1652, a bill entitled "Nutrition Labeling and Information Amendments of 1979 to the Federal Food, Drug, and Cosmetic Act" was jointly referred to the Senate Committee on Commerce, Science, and Transportation and the Senate Committee on Labor and Human Resources. It dealt with the labeling of foods regulated by the FDA (Congressional Record, 1979).

These bills closely parallel each other, with slight differences. The following is a brief, descriptive outline of the major nutrition labeling provisions, emphasizing the FDA bill, S. 1652:

1. FDA would be authorized to require nutrition labeling for all food. Such nutrition labeling would be required to include at least the calories per serving, the amount per serving of protein, fat, and carbohydrate in terms of caloric content, and the amount per serving of sodium and cholesterol, unless FDA determines that such information is not necessary to provide health information to consumers. Whether, and to what extent, any other nutrition information (such as vitamin and mineral content) would be required as part of nutrition labeling would be at the discretion of FDA.

2. FDA would be directed, to the maximum extent feasible and appropriate, to permit the use of nutrition data bases that indicate representative (weighted) nutritional value

at point of purchase in order to determine the information to be included in nutrition labeling.

3. FDA would be authorized to prescribe a system of symbols, figures, or other devices that would enable consumers to comprehend nutrition labeling.

4. The nutrition and ingredient information specified under Federal law would preempt State law.

5. FDA would be authorized to approve demonstration projects to determine more effective methods of providing information to consumers through food labeling, with particular emphasis on nutrition information.

6. FDA would be required to develop, pilot test, and implement a program of consumer education on how to use nutrition labeling effectively.

7. FDA would be required to notify the FTC of its nutrition labeling requirements and to recommend to the FTC which, if any, of such requirements should also be required by the FTC to be included in food advertising.

8. USDA would be authorized to develop and publish a standardized reference on the nutrient composition of all food, which can serve as the basis for nutrition labeling (Hutt and Sloan, 1979, p. 2).

Although these bills were never passed into law, they generated much controversy, due to specific wording of particular provisions, and have influenced subsequent food labeling bills that have been introduced into the Congress.

Current Nutrition Labeling Regulations

To this day, the regulations governing nutrition labeling are voluntarily provided by manufacturers but become mandatory where inclusion of: ". . . any added vitamin, mineral or protein in a product, [or] . . . any nutrition claim or information, other than sodium content, on a label or in advertising for a food" is required (GSA, 1981a, p. 17).

Mandatory Information

In both cases, the mandatory labeling is required, as stated in section 101.9 of 21 CFR, to declare the following information in the following order, using the headings specified, under the overall heading of "Nutrition Information Per Serving (Portion)." The terms "Per Serving (Portion)" are optional:

1. 'Serving (portion) size'
2. 'Servings (portions) per container'
3. 'Caloric content' or 'Calories'
4. 'Protein content' or 'protein'
5. 'Carbohydrate content' or 'Carbohydrate'
6. 'Fat content' or 'Fat'

   Fatty acid composition, cholesterol composition, and sodium content are only required to be placed on the nutrition label, following "fat" information and in that order, when a specific nutrition claim has been made about them on the food label.

7. 'Percentage of U.S. Recommended Daily Allowances (U.S. RDA)'

   a. Protein, amount per serving (portion)
   b. Seven vitamins and minerals including vitamin A, vitamin C, thiamine, riboflavin, niacin, calcium, and iron, in that order and shall include any of the (following) vitamins and minerals . . . when they are added (and/or) . . . when they are naturally occurring . . . vitamin D, vitamin E, vitamin B_6, vitamin B_{12}, folic acid, phosphorous, iodine, magnesium, zinc, copper, biotin, and pantothenic acid (GSA, 1981a, pp. 18-21).

Special Nutrient Claims

The CFR (1981a) states that no food may claim that it is a significant source of a nutrient unless that nutrient is present in the food at a level equal to or in excess of 10 percent of the U.S. RDA in a

serving (portion). Neither can a food claim that it is nutritionally superior to another food, unless it contains at least 10 percent more of the U.S. RDA of the claimed nutrient per serving (portion) than that food.

Products which are sold with separately packaged ingredients must have nutritional labeling of the total product on the outer container to provide information for the consumer at the point of purchase. If no outer container is provided (e.g., two cans combined in a clear plastic overwrap), each product shall have its own nutrition information (GSA, 1981a).

Products to which other ingredients are commonly combined before eating, and directions for such combinations are provided by the manufacturer or distributor (e.g., cake mix, ready-to-eat cereal), may provide another column of the U.S. RDA values, to list the nutrient contents for the final combination. The type and quantity of the ingredients (to be added to the product by the user) shall be specified (GSA, 1981a).

Compliance

For the purpose of compliance, the CFR (1981a) defines two classes of nutrients:

> Class I. Added nutrients in fortified or fabricated foods.
>
> Class II. Naturally occurring (indigenous) nutrients . . . in a food . . . or ingredient which contains a naturally occurring (indigenous) nutrient . . . unless the same nutrient is also added [then the food falls under Class I] (p. 21).

Allowing for natural variations - a food would not be considered misbranded as long as the vitamin, mineral, and protein content is at least equal to that declared in Class I foods, and at least equal to 80

percent of the declared value in Class II foods.

A calorie, carbohydrate, and/or fat label declaration must not contain more than 20 percent excess of the nutrient value declared on the food label. But, a reasonable excess of vitamin, mineral, and protein, and a reasonable deficiency of calories and/or fat from that declare on the food label are acceptable within good manufacturing practices (GSA, 1981a).

Exceptions

There are always exceptions to any rule. Manufacturers or distributors providing nutrition information directly to professionals (e.g., dietitians) may vary their nutrition information format from the previously stated requirements provided that this information is accompanied by nutrition information exactly as required by the regulations previously stated (section 101.9 of 21 CFR).

The following foods are exempt from the FDA's nutrition labeling format regulations and are subject to special dietary use labeling requirements:

1. Infant, baby and junior-type food promoted for [use solely by] infants and children under four years of age . . . .

2. Dietary supplements are exempted, except that the labeling of a dietary supplement in food form, e.g., a breakfast cereal, shall conform to the labeling (previously set forth in this section, for the declaration of nutrition information on the label and in labeling), including the order for listing vitamins and minerals.

3. Any food represented for use as the sole item of the diet (e.g., special dietary food(s) for needs which exist by reason of age) . . . .

4. Foods represented for use solely under medical supervision to meet nutritional requirements in specific medical

conditions (e.g., foods for use in the diet of diabetics) . . . .

5. Iodized salt . . . when used in a food does not subject that food to labeling . . . if it is declared in the ingredient statement by its name (iodized salt) and neither iodine nor iodized salt is otherwise referred to on the label or in labeling or advertising.

6. A nutrient(s) included in food solely for technological purposes may be declared solely in the ingredient statement . . . if the nutrient(s) is otherwise not referred to on the label or in labeling or in advertising.

7. A standardized food containing an added nutrient(s), e.g., enriched flour, and included in another food as a component may be declared in the ingredient statement by its standardized name . . . if neither the nutrient(s) nor the component is otherwise referred to on the label or in labeling or in advertising.

8. Food products shipped in bulk form for use solely in the manufacture of other foods and not for distribution to consumers in such bulk form or container.

9. Food products containing an added vitamin, mineral, or protein, or for which a nutritional claim is made on the label or in labeling or in advertising, which are supplied for institutional food service use only: Provided, that the manufacturer or distributor provides the nutrition information required . . . directly to those institutions on a current basis.

10. Fresh fruits and fresh vegetables, pending promulgation of specific labeling requirements for these products (GSA, 1981a, pp. 21-22.

Misbranding of Special Dietary Food(s)

If a special dietary food(s) labeling represents, suggest, or implies any of the following, it shall be deemed misbranded according to the CFR:

1. That the food because of the presence or absence of certain dietary properties, is adequate or effective in the prevention, cure, mitigation, or treatment of any disease or symptom.

2. That a balanced diet of ordinary foods cannot supply adequate amounts of nutrients.

3. That the lack of optimum nutritive quality of a food, by reason of the soil on which that food was grown, is or may be responsible for an inadequacy or deficiency in the quality of the daily diet.

4. That the storage, transportation, processing or cooking of a food is or may be responsible for an inadequacy or deficiency in the quality of the daily diet.

5. That the food has dietary properties when such properties are of no significant value or need in human nutrition . . . . such as rutin, other bioflavonoids, para-amino-benzoic acid, inositol, [etc.] . . . [these nonessential ingredients also] may not be combined with vitamins and minerals, added to food . . . or otherwise used or represented in any way which states or implies nutritional benefit . . . .

6. That a natural vitamin in a food is superior to an added or synthetic vitamin, or to differentiate in any way between vitamins naturally present from those added (GSA, 1981a, p. 23).

Proposed Actions

The tri-agency publication, "1979 Tentative Positions", contained the following proposed actions regarding nutrition labeling. Some required promulgation of new regulations, to amend existing laws, while others required the agencies to seek new legislative authority.

Mandatory, Discretionary, or Voluntary Nutrition Labeling

Although nutrition labeling is presently a voluntary program, unless triggered by nutrient claims, the question still remains as to whether nutrition labeling should be made mandatory - or authority be legislated to the FDA and USDA, enabling them to require nutrition labeling at their discretion. Schucker (1978) conducted a survey for the FDA, to investigate the extent of nutrition labeling in the USA. Based on 1976 retail sales, on a dollar basis, nutrition labeled foods

accounted for approximately $18 billion in sales per year, translating into about 40 percent of all packaged processed foods. Of the leading national brands, 40 percent displayed nutrition information and, of those, approximately 60 percent did so voluntarily. The remaining 40 percent fell under the mandatory labeling regulations.

The food product categories that carry the most nutrition labeling included: cereals, margarine, and powdered soft drinks, with 100 percent of total sales; flour, 99.5 percent; dry pasta, 92.3 percent; canned and powdered milk, 80.6 percent; baby foods, 74.5 percent; and frozen juices and drinks, 71.8 percent. Included within the food product categories that carried no nutritional labeling are: coffee; sugar condiments; pickles and relishes; refrigerated miscellaneous food; salt, seasoning, and spices; canned sauces; refrigerated condiments and sauces; refrigerated seafoods; and refrigerated salads (Schucker, 1978).

Nutrition labeling had come a long way, yet the USDA still did not have regulations for meat and poultry products. It had always accepted and used the FDA's nutrition labeling approach on a voluntary basis, and had allowed the use of an abbreviated format (e.g., declaration of only the caloric, protein, carbohydrate, and fat content) in order to generate interest in nutrition labeling (U.S. DHEW, USDA, and FTC, 1978).

Thus, the agencies proposed that the:

> USDA will propose regulations that would require nutrition labeling where nutrition claims are made for a product or where certain nutrients have been added to the product . . . a task force [should be established] to develop criteria for determining which additional foods should bear nutritional labeling . . . [according to] (a) the significance of the food in the diet, (b) the potential for misleading the public when a food does not have nutrition labeling, and (c) other matter of public health significance (Fed. Reg., 1979, p. 76001).

Nutrition Labeling Format

The "FDA 1978 Consumer Labeling Survey" found that:

> . . . the most common single complaint [about confusion with nutrition-labeled information] was about the quantitative terminology - primarily the metric system, but also percentages and U.S. RDAs. These accounted for nearly half (44%) of the complaints. Technical terminology and complaints that the information is simply not usable to the consumer in evaluating the health impact of the food were mentioned next. A number of respondents admitted that they could not understand any of the information (Heimbach and Stokes, 1979, p. 46).

Taking the accumulated information into consideration, the agencies decided to propose to:

> . . . retain the present nutrition labeling system pending the outcome of research to determine which format consumers find most useful and convenient and what changes, if any, are appropriate . . . . The agencies will establish an interagency task group to work with industry and consumers to develop proper experimental designs and the appropriate criteria for evaluating these experiments (Fed. Reg., 1979, p. 76001).

An example of the difficulties industry has encountered in trying to conduct experiments with various nutrition labeling formats is the Giant Food case. On July 21, 1980, the FDA disclosed its plans for regulations at a meeting with officials of Giant Food, a Washington, D. C. area food chain store (Food Chem. News, 1980d). Giant Food stores had wanted to introduce shelf labeling for special diet foods, and keep track of the sales of them with computer assisted checkout data. They had requested an exemption from the nutrition labeling regulations for those products not able to be appropriately labeled during the study (Food Chem. News, 1980a). Months later, the FDA still had not given Giant Food permission for exemption, and requested more information from them, on their experimental design. The FDA later cautioned industry that the procedure for exempting proposed labeling experiments from

certain labeling requirements, ". . . because of the agency's workload, it may take a period of time before a proposed experiment is reviewed and authorized," and urged all firms to ". . . take this fact into consideration in planning experiments" (Food Chem. News, 1980f, p. 20).

Mandatory Information for Nutrition Labeling

This issue involves the questions of whether or not government should change the list of mandatory nutrients on nutrition labels and whether it should require the amount declaration of all mandatory nutrients, regardless of the quantities in which they are present (or not present).

Evidence gathered from the labeling hearings, requested written comments, and FDA's "1978 Food Labeling Survey" disclosed that the U.S. public is most interested in the macronutrient (calories, carbohydrates, protein, fat) that normally appears at the top of nutrition labels (Fed. Reg., 1979).

> About two-thirds of consumers pay attention to the information on the nutrient label, especially to data on calories, vitamins, protein, fat, and carbohydrates, in that order. Very few - only about 6% - claim to pay attention to the entire label (Heimbach and Stokes, 1979, p. 36).

These results could be interpreted to support that currently too much information is trying to be presented via the label, or consumers do not understand the nutrition information adequately enough to utilize it profitably. Since the latter case is generally accepted as the root of the problem (ADA Reaffirms Support, 1979; Congressional Record, 1979; Engstrom, 1980; Fed. Reg., 1979; Hammons, 1978; Heimbach and Stokes, 1979; Society for Nutr. Ed., 1978), it becomes apparent that more information about nutrition labeling and education on how to use it needs to

be provided.

Thus, even though the U.S. public seems to have a sizeable amount of interest in caloric content, the agencies concluded that it would be inappropriate to just provide calorie information, ". . . because it would fail to provide a balanced presentation of foods' nutrition characteristics" (Fed. Reg., 1979, p. 76002).

The question involving the declaration of mandatory nutrients present, in quantities less than two percent of the U.S. RDA per serving, also raise interesting questions about how flexible the government's nutrition labeling policy should be.

> A policy that reflects the principle that declaring what is not in the food can sometimes be as important as declaring what is in it. Moreover, increasing concern about the adequacy of the amounts of certain micronutrients such as zinc, folic acid, and copper in many diets gives greater urgency to the question of mandatory or voluntary declaration of these nutrients (Fed. Reg., 1979, p. 76002).

The agencies subsequently proposed that the:

> FDA will continue its current policies for declaring mandatory nutrients . . . and other information pertaining to serving size and servings per container. USDA will continue to permit use of both the format similar to FDA's and the Abbreviated format consisting of macronutrients, calories, and other information deemed useful to consumers. USDA will also propose nutrition labeling regulations to provide information on calories, carbohydrates, protein, fat, sugars, cholesterol, sodium, and other nutrients of public health concern (Fed. Reg., 1979, p. 76003).

Composite Data Base for Use in Nutrition Labeling

The discussion on this subject revolved around whether the FDA and USDA should continue their policy of requiring food manufacturers and producers to analyze individual lots of products - placing the responsibility for the ability of their food labels, to accurately reflect the

nutrient composition of their products, on them. The other option would be for the FDA and USDA to allow manufacturers and producers to derive their nutrient values for labeling from a composite data base.

The cost of establishing and maintaining nutrient-data banks is the biggest deterrent to manufacturers and producers.

> One company with 60 products has estimated it cost $300,000 to set up a nutrition labeling program and $40,000 annually to maintain it . . . cost estimates by various companies range anywhere from $3,000 to $10 million (Food Chem. News, 1980c, p. 4).

Consequently, the agencies proposed that the:

> FDA and USDA will maintain for now the current policy that products be labeled according to composition, and that the manufacturer is responsible for ensuring the validity of nutrient content expressed on the food label . . . . The agencies strongly support the development and use of modern data bases for nutrition labeling, and their inclusion in the National Nutrient Data Bank (Fed. Reg., 1979, p. 76003).

The following February, 1980, officials from the FDA and USDA laid out plans to set up a joint committee that would begin work on adding information to USDA's already existing nutrient data bank. It was hoped that this comprehensive nutrient data base would be the forerunner of mandatory nutrition labeling, with the accompanying passage of the McGovern food labeling bills supplying the legislative authority. The agencies had hoped to require nutrition labeling, once they were satisfied that there existed adequate data for a given food in the data base.

> The data bank would include three classes of products: fresh products such as chicken breasts and apples where nutrition labeling would be 'encouraged' but not required; processed products such as hot dogs; and specialty type products such as 'buffalo salami and packaged kumquats,' which might never be the subject of a nutrient data base (Food Chem. News, 1980c, p. 5).

The agencies had considered the natural variability of nutrients that exists in foods and,

> . . . noting that the basis for reasonable limits may vary depending of whether a nutrient is stable or unstable in processing or whether it is essential or easily obtainable in other foods . . . the [FDA] was considering two standard deviations below the mean for the limits (Food Chem. News, 1980c, p. 5).

An argument has always existed about the disproportionate cost burden that small food processors would experience if nutrition labeling became mandatory and thus required them to maintain a nutrient data bank. The agencies acknowledged this problem and proposed to establish a system with enough flexibility to lessen the burdens of small food processors. They would not, however, be exempt from nutrition labeling, because it ". . . does force a certain degree of quality control on the product(s)" (Food Chem. News, 1980c, p. 5).

Since the McGovern bills did not pass Congress, and no further pieces of legislation have followed that proposed to invest the FDA and USDA with authority to make nutrition labeling mandatory, or even discretionary, nutrition labeling remains basically voluntary. Nevertheless, the agencies have continued their efforts to work with industry, to improve the existing data bases.

Serving Sizes

Although this was not a major issue among the tri-agency hearings, the FDA and USDA realized the importance of uniform serving sizes for all products within a category of foods to ensure uniform nutrition labeling information. The agencies decided to step in where industry had failed and proposed that the:

> FDA will publish final serving size regulations for some beverage products, cereal, and meal replacements. FDA and USDA will propose regulations to establish serving sizes for additional product classes and/or types of foods (Fed. Reg., 1979, p. 76004).

Labeling of Sugars

Although the cereal industry has voluntarily included a breakdown of carbohydrates and simple carbohydrates (sugars) for several years, no existing Federal regulations specifically regulate the quantitative labeling of a food's content of sugars. Thus, the agencies suggested that the:

> FDA will propose to amend the nutrition labeling regulations to require quantitative declaration of total sugars as part of nutrition labeling. USDA will propose regulations to require, as part of nutrition labeling, quantitative declaration of the total sugars a food contains . . . USDA and FDA will seek or support legislation to provide them with explicit discretionary authority to require quantitative labeling of sugars on the basis of public health significance . . . the agencies will conduct an educational program to increase consumers' understanding of how sugars are declared on food labels (Fed. Reg., 1979, p. 76004).

In the "FDA 1978 Consumer Food Labeling Survey", the ". . . only information not shown on current labels which attracts high interest is sugar content . . . respondents exhibited a distinct preference for a breakout of sugars by type" (Heimback and Stokes, 1979, pp. 58-59). The agencies concluded that sugar labeling information belongs with nutrition labeling on the food label, because the total sugar content of the product showed so much interest to consumers. "If the labeling of sugars appeared in the ingredient statement, only added sugars would be declared, even though indigenous sugars contained in the other ingredients could constitute the bulk of sugars in the product" (Fed. Reg., 1979, p. 76005).

Subsequently, the FDA contracted Little to do a study of the cost to industry for the agency's proposed regulation, that would require a quantitative declaration of the sugar composition of food products on the nutrition label. Little estimated that the compliance

costs for the first year alone could range from $23.5 - 83.3 million.

> The estimated cost for the first year varies, depending upon the definition of sugar and the trigger point chosen. Little did a cost analysis for each definition, . . . (1) mono- and disaccharides; (2) mono- and disaccharides and alcohol sugars; (3) mono- and disaccharides and oligosaccharides up to four; and (4) mono- and disaccharides, oligosaccharides, and alcohol sugars (Food Chem. News, 1981l, p. 40).

Little found that the test(s) (high performance liquid chromatography or gas chromatography) used for the third and fourth definitions would be five-to-eight percent more expensive than the test (colorimetric) for the first, simplier definition. The addition of alcohol sugars to the definition would increase compliance costs 60-70 percent. Little summarized:

> If the markup for the sample products is applied to all segments, consumer expenditures would increase a maximum of $43-49 million, again depending upon the regulatory alternative selected. The long term increase in total consumer expenditures would be $2.2-9.8 million (Food Chem. News, 1981l, p. 41).

Sodium and Potassium Labeling

FDA's current nutrition labeling regulations, and USDA's nutrition labeling regulations pertaining to egg products, permit quantitative listing of sodium as an optional addition to nutrition labeling (see p. 39 of this chapter). These regulations also specifically exclude declaration of sodium content as a nutrition claim or information that would trigger full nutrition labeling (U.S. DHEW, USDA, and FTC, 1979).

Concerns about the possible health hazards posed by sodium intake have been expressed by:

> . . . the Senate Select Committee on Nutrition and Human Needs in its 1977 report, 'Dietary Goals for the United States'; the Select Committee on GRAS Substances (SCOGS) in its report on the Tentative Evaluation of the Health Aspects of Sodium Chloride and Potassium as Food Ingredients; the Center for Science

> in the Public Interest in a citizen's petition to the FDA; the Hypertension Task Force in its report of the National Heart, Lung and Blood Institute's Salt and Water Subgroup; and the Subcommittee on Sodium-Restricted Diets of the Food and Nutrition Board of the National Academy of Sciences (U.S. DHEW, USDA, and FTC, 1979, p. 47).
>
> The agencies, therefore, concluded that the:
>
> . . . FDA will propose to amend its nutrition labeling regulations to require the declaration of sodium and potassium content as a part of nutrition labeling. USDA intends to propose regulations that would require sodium labeling as a part of nutrition labeling, it will consider including potassium labeling in this proposal. FDA and USDA will propose regulations to define 'low sodium' . . . 'reduced sodium' foods and standardizing the claims appropriate for foods containing no added sodium. FDA will seek or support legislation to provide it with explicit discretionary authority to require a quantitative labeling of sodium and potassium on the basis of public health significance. USDA believes it has such authority but will support legislation to provide more explicit authority for both agencies (Fed. Reg., 1979, p. 76005).

According to a May 29, 1980, FDA letter from Quinn, Associate Director for Compliance of the Bureau of Foods, ". . . potassium labeling is not now expected to be required as a part of the sodium labeling document" (Food Chem. News, 1981d, p. 20). Sodium labeling hearings were held by the U.S. House of Representatives' Science and Technology Subcommittee on Oversight and Investigations, in April, 1981. The committee wanted to determine where the Federal agencies, industry, and health professionals stood on the matter (Food Chem. News, 1981h, p. 59). To date, no regulatory action has evolved concerning sodium or potassium labeling.

Fatty Acid and Cholesterol Labeling

> FDA will continue to require that the cholesterol or fatty acid content of a food be included on nutrition labeling when claims about these substances are made. FDA will propose to amend the fatty acid/cholesterol regulation to require fatty acid labeling whenever cholesterol is declared and cholesterol labeling whenever fatty acids are declared. FDA will propose

> to amend the present fatty acid/cholesterol regulation to eliminate the requirement for the statement 'Information on fat (and/or cholesterol as appropriate) content is provided for individuals who, on the advice of a physician, are modifying their dietary intake of fat (and/or cholesterol as appropriate).' FDA will propose a regulation to define the terms 'low cholesterol', 'reduced cholesterol', and 'cholesterol free'. FDA will also consider proposing regulations to govern claims about fatty acid content (Fed. Reg., 1979, p. 76006).

The USDA has no specific regulations that cover fatty acid or cholesterol labeling, thus, the labeling of meat, poultry, and egg products have followed FDA's guidelines. FTC's Division of Food and Drug Advertising, concerned about advertising claims in this area, have recommended that the Commission require certain fatty acid and cholesterol information in those ads making such claims (Fed. Reg., 1979).

> . . . FDA will seek or support legislation to provide it with explicit discretionary authority to require cholesterol/fatty acid content labeling on the basis of significance to public health. USDA believes it has such authority but will support legislation to provide more explicit authority for both agencies . . . [and] will propose regulations to require cholesterol labeling as part of nutrition labeling (Fed. Reg., 1979, p. 76006).

Fiber Labeling

FDA, USDA, and other interested industry scientists are currently conducting research involving the various aspects of fiber that are causing such scientific uncertainty and controversy. Thus,

> . . . FDA and USDA will not require dietary fiber labeling as part of nutrition labeling until there is a clearer consensus on a definition of dietary fiber, until methods of analysis are developed, and until its significance in the diet is better understood (Food Chem. News, 1979, p. 76007).

Disease-Related Claims on Food Labels

FDA regulations specifically prohibit claims in labeling that,

". . . a food is adequate or effective in the prevention, cure mitigation, or treatment of a disease or a symptom" (GSA, 1981a, p. 23). Accordingly, ". . . the FTC has challenged such claims in food advertising, and the FTC staff has proposed that the Commission prohibit the use - in advertising - of claims that violate this FDA regulation" (Fed. Reg., 1979, p. 76006).

Interestingly, the "FDA 1978 Consumer Food Labeling Survey" discovered that, by a two-to-one margin, consumers preferred information about nutrients they tend to eat too much (e.g., calories, cholesterol, saturated fat, salt and/or, sugar), rather than those foods they tend to get too little (e.g., protein, vitamins, and minerals).

> Consumers are much more concerned with perceived risks and hazards of food than with potential nutritional benefits, and they prefer labling to be designed more to tell them about hazards (real or imagined) rather than benefits (Heimbach and Stokes, 1979, p. 62).

The FDA and USDA intend to continue the existing policy of not allowing disease-related claims to appear on the labeling of conventional food products. They will, however, analyze any new proposals in regard to this subject, if the need should arise to do so. The agencies are also examining proposals for regulations to cover "medical foods" (e.g., products used to treat phenylketonuria [PKU]), permitting them to bear therapeutic claims in their labeling (Fed. Reg., 1979).

Nutrition Professionals and Nutrition Labeling

Ten years ago in Philadelphia, at the 54th Annual Meeting of the ADA, on October 7, 1971, Grant (then Deputy Commissioner of the FDA) presented the FDA's new philosophies with respect to both content and labeling of processed foods. Resulting from recommendations of the

1969 White House Conference on Food, Nutrition, and Health - the nutrition labeling program was initiated and dietitians' cooperation was requested.

> As dietitians whose stated professional goal is to work to guard and maintain the nutritional health of the population, you must make our voices heard. You are a vital resource in the progress against hunger and malnutrition, for you are a source of leadership to guide government and industry . . . . The FDA values your comments and asks you to use this opportunity to the fullest (Grant, 1972, p. 383).

Since then, the ADA has issued a "Policy Statement on Nutrition Labeling" in May, 1972, and a statement that "ADA Reaffirmed Support of FDA Regarding Food Labeling" in July, 1980. The latter statement said,

> Until the public is educated to appreciate the importance of food nutrition to good health, it will make the effort neither to understand nor to apply the information on labels that could assist in improving food choices (P. 74).

The Society for Nutrition Education (SNE), in their "Position Statement on Food Labeling", said that they felt it:

> . . . is the responsibility of FDA and other regulatory agencies to ensure that food labels have informational and educational value that is consistent with the goals and objectives of nutrition education. At the same time, food labeling is not in itself nutrition education and should not be considered a substitute for other programs. Education on how to use the food label is needed in order that consumers may take advantage of available information. Such education should go beyond merely alerting consumers to the existence of label information; it should be integrated into new and existing programs in schools, and in public and private-sector education programs for consumers, professionals, and patients on special diets (SNE, 1978, p. 2).

In 1979, Winterfeldt delivered an ADA statement to the Subcommittee on Science, Research, and Technology of the Committee on Science and Technology, U.S. House of Representatives. She noted that there exists a general area of need in:

> . . . the provision of methods to interpret and apply scientific research into nutrition services. It is not sufficient to report research findings in scientific journals; we must

> find ways of effectively disseminating the findings in appropriate and usable ways across disciplines. Nutrition education and dietary intervention programs can be effective only when based on a scientific core of knowledge aptly translated (Nutr. Research Methods, 1979, p. 293).

To date, only two surveys have been conducted on nutrition professionals, specifically AIN members, who are primarily research and teaching oriented (Call and Hayes, 1970; Heimbach and Stokes, 1981). The researcher, therefore, believes that it is time that the ADA takes the FDA up on their request for their input by asserting the opinions of nutrition professionals. Professionals who are institutional buyers that have applied knowledge, enabling them to determine the most useful information and format that should be developed, and taught, to the average consumer.

CHAPTER III

RESEARCH PROCEDURES

The encompassing purpose of this research project was to determine the nutrition labeling attitudes of dietitians in management, and to what degree these attitudes influenced their "consumer" practices. The probability that a particular relationship existed between these practices, and their perceived goals for nutrition labeling, as well as whether or not a relationship existed between their priorities regarding nutrients and diet-related health problems were also analyzed. Although it is believed that human food behavior has been influenced by nutrition knowledge, previous resarch failed to verify a strong relationship (Olson and Sims, 1980). Accordingly, the researcher noted that one of the major criticisms of nutrition labeling, to date, hads been based on the perception that consumers failed to understand the nutrition information and were, thus, unable to use it properly. Therefore, research focused on the determination of attitudes and practices of dietitians in management could provide vital comparison data between nutrition professionals and average consumers. The researcher purports that the affect(s) of varying degrees of nutrition knowledge on nutrition labeling attitudes and practices can subsequently be evaluated.

Type of Research Design

Theoretical Background

According to Carruth and Anderson (1977, p. 42), " . . . among the variables affecting both the acquisition of knowledge and its later application is the learner's attitude." Fishbein and Ajzen (1975, p. 6) described attitude as, "a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object." This description had been interpreted in numerous ways with underlying ambiguity attributed to "the notion that attitude is learned, that it predisposes action, and that such actions are consistently favorable or unfavorable toward the object" (Fishbein and Ajzen, 1975, p. 6). Ultimately, it was purported that,

> . . . a person's attitude toward an object is based on his [her] salient beliefs about that object . . . the totality of a person's beliefs serves as the informational base that ultimately determines his [her] attitudes, intentions, and behavior (Fishbein and Ajzen, 1975, p. 14).

In a study done by Peterson and Kies (1972), that focused on the nutrition knowledge and attitudes of early elementary teachers, they reported that attitudes influenced behavior, ungoverned by an individual's level of knowledge pertaining to nutritional concepts and practices. A few years later, Schwartz (1975), studied the nutritional knowledge, attitudes, and practices of high school graduates. She found that a significant correlation existed between knowledge and attitudes and between attitudes and practice, but none between knowledge and practice. Thus, although the focus of numerous research studies throughout the years had been on the measurement of nutritional knowledge, "the literature documents that the level of nutritional knowledge, per se, is

not indicative of, or necessarily sufficient to change the level of practice" (Carruth and Anderson, 1977, p. 42).

Organization of Hypotheses

With these theories, and studies on food/nutrition practices, attitudes, and knowledge relationships in mind, the researcher organized her hypotheses as shown in Figure 1.

Conceptual Framework

The researcher then devised the following conceptual framework to illustrate her hypotheses as shown in Figure 2. The researcher proposed that there were two general types of beliefs held by consumers that influenced their attitude(s) toward utilizing nutrition labeling information. These were beliefs about the consequences of utilizing nutrition labeling information, and the beliefs about what behavior was expected of them - how they perceived other consumer's behavior(s), and their perception of existing pressure to comply with the norm. The latter belief was harder to measure accurately, and had been classified within the researcher's assumptions. Because this study involved nutrition professionals as subjects, it was assumed that their belief(s), about their expected attitudes(s)/behavior(s), involved significantly higher pressure to comply than the average consumer.

> Most people hold both positive and negative beliefs about an object, and attitude is viewed as corresponding to the total affect associated with their beliefs . . . a person's attitude toward some object is related to the set of his(her) beliefs about the object but not necessarily to any specific belief (Fishbein and Ajzen, 1975, p. 14).

Relative to this theory, the researcher believed that consumers' set(s) of beliefs about nutrition labeling involve the positive effect of

ORGANIZATION OF HYPOTHESES

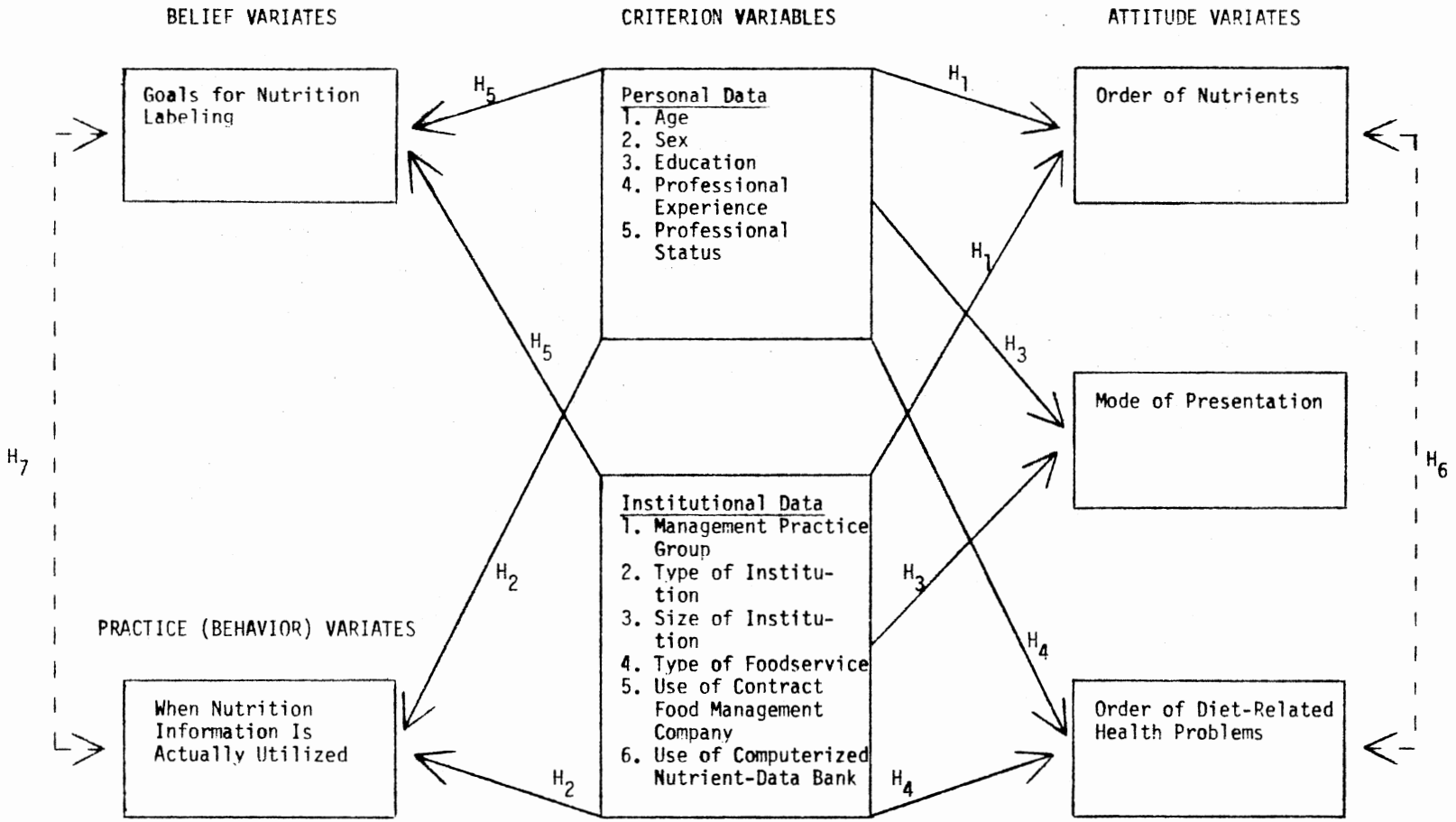

Figure 1. Organization of Hypotheses

CONCEPTUAL FRAMEWORK

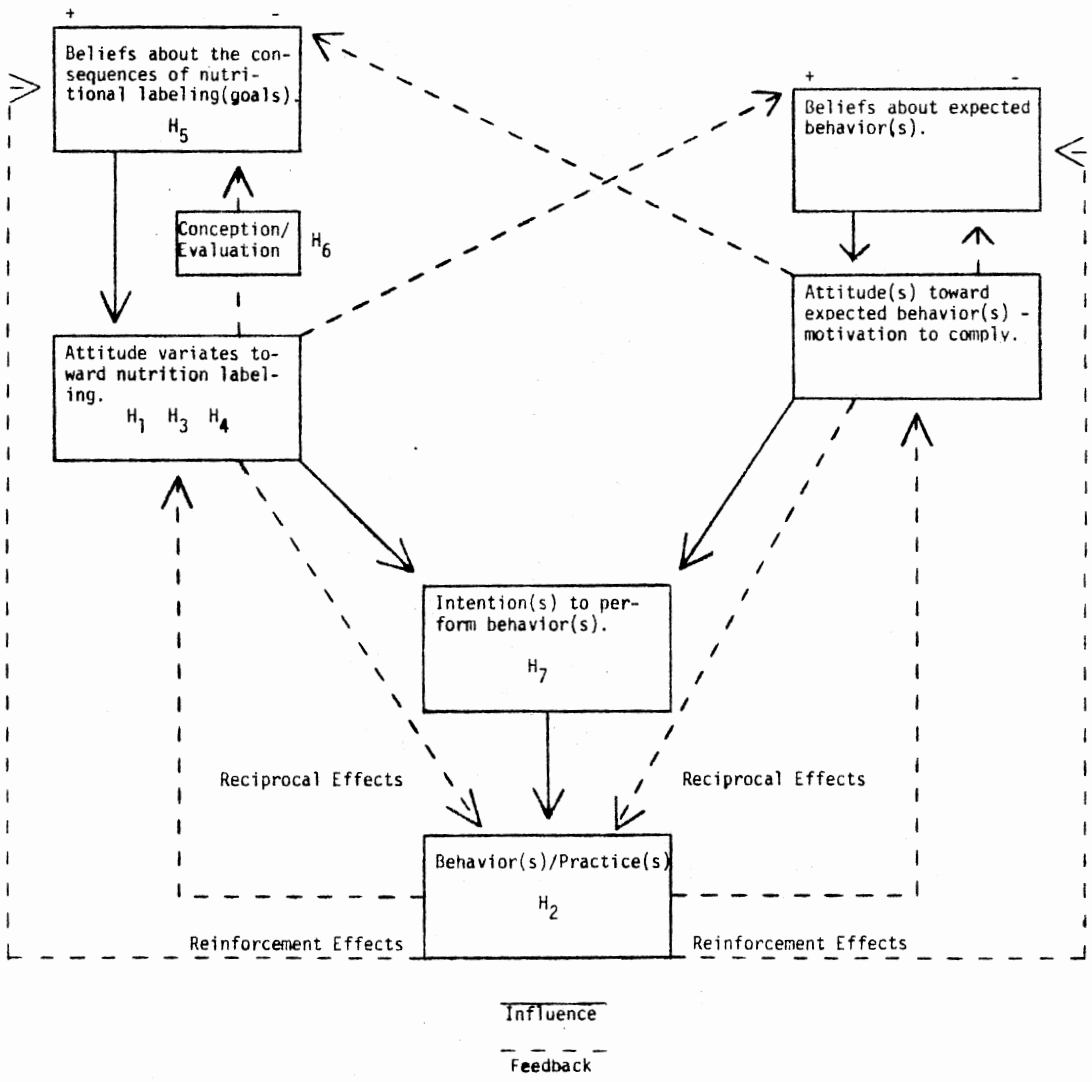

Figure 2. Conceptual Framework

increased health, but also entail the negative effects of increased costs - due to compliance costs and the increased need for consumer education.

Since attitudes ". . . cannot be observed directly, but have to be inferred from observed consistency in behavior" (Fishbein and Ajzen, 1975, p. 8), the researcher believed that H_6 would be a good device to check the dietitians' attitudes toward nutrition labeling - this hypothesis was also to be used to confirm their assumed positive, learned predisposition toward nutrition labeling information. The terms conception/evaluation were applied to this step because:

> . . . concept is a more generic term than attitude and, as a cognitive process, provides the basis for the formation of evaluations. Conception is essentially the act of placing two or more psychological entities in some relationship with one another . . . when the concept acquires an evaluative significance . . . it begins to approximate an attitude (Shaw and Wright, 1967, pp. 4-5).

Based on the aforementioned information, the researcher concluded that the remaining attitude variate, H_3, was to be inferred if consistency in these attitudes, of the entire sample population, resulted.

The researcher wanted to illustrate that, although not measurable, the expected beliefs and attitudes (motivation to comply) of consumers affected their intentions to perform a behavior. It was perceived that this component of intention formation became much more influential, for nutrition professionals, as consumers' priorities and requests for nutrition labeling information increase - intensifying what's expected of them, and the pressure to comply with consumers' requests.

Fishbein and Ajzen (1975) claimed that:

> . . . attitude toward an object is viewed as related to the person's intentions to perform a variety of behaviors with

> respect to that object . . . (however) the performance or non-performance of a specific behavior with respect to some object usually cannot be predicted from knowledge of the person's attitude toward that object. Instead, a specific behavior is viewed as determined by the person's intention to perform that behavior (pp. 14 and 16).

The researcher consequently determined that, through examination of H_7, one could infer the degree of intention(s), that dietitians in management actually maintain, toward implementation of nutrition labeling information into their professional meal planning and procuring.

Finally, "behavior" was classified by the researcher as H_2 - practice variables - and the dashed lines of feedback illustrate: the reinforcement effects that behavior has on belief(s); the reciprocal effects that attitudes and behavior can have on one another, for Triandis (1971) believes that people can develop attitudes to justify their previous behavior - resulting in changing their attitudes which, in some cases, could even lead to the development of new behavior(s).

Type of Survey

The researcher determined that a descriptive, mail survey was the best mode of data collection. This type of study was concerned with gathering information on functional relationships, from relatively large number of cases within a short period of time, based upon: ". . . present conditions . . . clarification of objectives or goals . . . opinions of experts, who presumably know best how to reach the goal" (Best, 1977, p. 116). This mode of data collection also paralleled that which was employed by Call and Hayes (1970) and Heimbach and Stokes (1981).

Population and Sample

The researcher chose to stratify and systematically sample members

of the ADA at random, who belonged to the Division of Management Practices. The division was made up of four dietetic practice groups (DPG) as shown in Figure 3:

1. Dietitians in Business and Industry (DIBI), a dietetic practice group for ADA members who own a business, work for a profit-making organization, or just have special interests in careers in business and industry . . . .

2. Dietitians in College and University Foodservice . . . .

3. Dietitians in School Food Service . . . .

4. ADA Members with Management Responsibilities in Health Care Delivery Systems. The members of this dietetic practice group are generally employed in acute care, extended care, or outpatient facilities . . . (Council on Practice, 1980, p. 7).

Permission was obtained from Lechowich, Coordinator of Council on Practice at ADA headquarters, to contact the chairpersons of the four dietetic practice groups. The researcher then requested permission from them to allow the ADA Data Processing Department to sell her their 1981 (revised as of September, 1981) membership mailing labels. These were released with the understanding that they had to be used for the sole purpose of conducting the researcher's survey (Appendix B).

A total of 2,925 mailing labels were obtained for: 1,811 ADA Members with Management Responsibilities in Health Care Delivery Systems (HDCS); 533 Dietitians in Business and Industry (DIBI); 405 Dietitions in School Food Service (SFS); and 176 Dietitians in College and Universities Food service (CUF). Within each stratum (HDCS, DIBI, SFS, and CUF), 80 labels were systematically chosen.

> Systematic sampling has two advantages over simple random sampling. It is easier to draw, since only one random number is required (15, 5, 4, and 2, respectively), and it distributes the sample more evenly over the listed population (Snedecor and Cochran, 1967, p. 519).

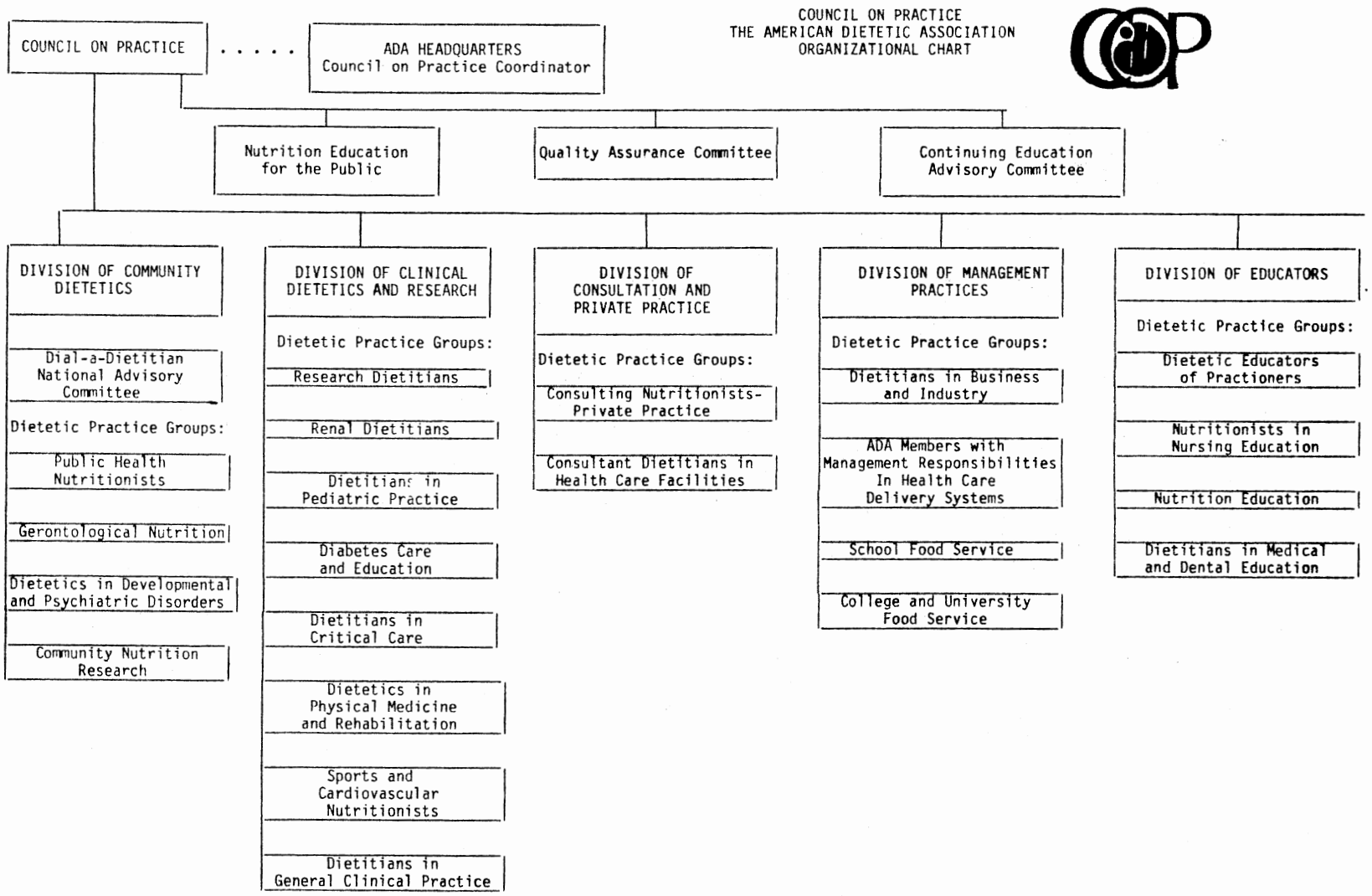

Figure 3. Organizational Chart of the Council on Practice, American Dietetic Association (1981)

Since research funds were the limiting factor in determining the ultimate sample size, stratification by practice groups was employed ". . . for the gain in precision," through a unity of attitude (Snedecor and Cochran, 1967, p. 520)

Instrumentation

The researcher consulted with Stokes (1981), Director, Division of Consumer Studies, Bureau of Foods, FDA on development of the instrument. The majority of the questionnaire was adapted from questions used in the "FDA 1978 Consumer Food Labeling Survey" and its 1979 subsurvey, mailed by the FDA, to AIN members, food manufacturers, and a national sample of consumer representatives (Heimbach and Stokes, 1979, 1981). In utilizing these data, the researcher desired to construct, and use, a highly valid instrument - one that enabled the researcher to accurately measure the defined hypotheses, and allowed determination of the reliabilty of data among groups of various nutrition education levels and emphasis (Appendixes C and D).

Oppenheimer (1966, pp. 69-70) stated that "Reliability refers to consistency, to obtaining the same results again. Validity tells us whether the question or item really measures what it is supposed to measure."

The researcher found support for her objectives, to obtain "concurrent validity" (Sims, 1981, p. 465) in a testimony delivered by Saegert to the Subcommittee on Science, Research, and Technology of the Committee on Science and Technology, U.S. House of Representatives.

> The utility of the data (consumer behavior data) collected depends greatly upon the validity and reliability of the measurement instruments used in the research process . . . . Extensive study will be necessary so that nutrition behavior

> researchers can also endeavor to provide external validation of research instruments. Another need is for more standardization of instruments across studies . . . (of all the studies, to date, that have been designed to measure consumers' knowledge of nutrition) each researcher has developed his or her own measure of the knowledge construct no comparisons across studies can be made; thus, some research effort needs to be expended on the task of developing standardized measurement instruments (Nutr. Research Methods, 1979, pp. 60-61).

The instrument was distributed to a panel of experts that represented: ADA registered dietitians in management positions at a hospital, college and university foodservice (both residence halls and student union foodservices), and school foodservice; a professor of nutrition education; and the researcher's thesis committee members.

Finally, the researcher formulated a scale score to measure the attitude construct, after adopting differential definitions for attitude and belief.

> Those responses or evaluations which cannot be judged as correct or incorrect but are simply based upon an individual's evaluations or feelings toward the object would be labeled attitudes. Where beliefs are involved, there should be a distinction between rightness-wrongness, correctness-incorrectness, probable-improbable (Sims, 1981, p. 464).

Data Collection

The researcher encountered an untimely delay in receiving the DPG mailing labels, from the ADA Data Processing Department. This delay was multifactored: the 1981 membership fee deadline was not until August 30th; this was the first year that the individual DPG would not maintain their own mailing labels - this information was to be centralized through ADA Data Processing; the ADA National Convention in Philadelphia, Pennsylvania, intervened and complicated communications to ensure release of the DPG mailing labels.

The four variations of the survey, developed for the respective

DPG, were sent to the 320 selected members in early October, 1981. The researcher eliminated as many "known", unqualified subjects as possible, from those selected. Disqualification resulted when the DPG member: was retired; a member for reasons other than affiliation with a DPG professional position; had deceased; and/or was residing outside of the U.S. A "Business Reply" envelope was enclosed to facilitate the surveys' return. The surveys were accepted until early November, 1981.

Data Analysis

Completed questionnaires were returned to the Central Mailing Office, at Oklahoma State University, and then collected by the researcher. The researcher then transcribed and coded the data for tabulation. The coded sheets were subsequently key-punched onto cards for processing on the computer using the Statistical Analysis System (SAS) (Barr and Goodnight, 1979).

Chi-square and Pearson's product-moment coefficient of correlation were the statistical methods used to test the hypotheses. Descriptive data were used to describe and record the following information:

1. Specified contract food management companies.
2. Specified computerized nutrient-data banks.
3. Specified health or disease-related truthful claims that <u>should</u> be allowed.
4. Specified preferred methods of displaying carbohydrate data.
5. Specified preferred methods of displaying information about sugars.
6. Specified preferred methods of displaying micronutrients.
7. Specified label information about substances <u>not</u> in the products.

8. Specified "other" useful nutrition information formats.
9. Specified suggestions for government and industry aid, to improve the utilization of nutrition labeling information.

Frequency distribution and percentages were also used, to describe the sample population. These statistics were correlated with corresponding results from Call's 1970 AIN study,and the 1978 and 1981 FDA studies (Heimbach and Stokes).

Comparison of Survey Results

One of the researcher's goals was to establish concurrent validity and reliability of data among groups of various nutrition education levels and emphasis. Thus, supplying needed information to nutrition behavior researchers' quest for the development of standarized measurement instruments. The data compared in this section came from identiacal, or paralled, questions compiled from the interrelated surveys of Call and Hayes, (1970), and Heimbach and Stokes (1979, 1981).

Nutritional Information

The question evaluating dietitians in management's (hereafter referred to a "dietitians") nutrition information priorities involved a list of 38 nutrients. The researcher asked the dietitians to rate the nutrients they think consumers (C) should pay attention to on food packages, and which they (D) paid attention to in their institutional procurement practices.

In order for the researcher to be able to compare this data to the "FDA 1978 Consumer Survey," and "Nutrition Labeling For Today's Needs," the responses were converted to rating scores. Accordingly, responses

of "very useful" were assigned a score of 100, "of some use" were assigned a score of 50, and "of little or no use" and do not know enough" were assigned scores of 0 (Heimbach & Stokes, 1981). Call and Hayes' 1970 mail survey involving 824 AIN members,

> . . . presented a similar but shorter (which did not include types of carbohydrates or the less familiar vitamins and minerals), asking respondents to set each nutrient's priority for label space as "high," medium," or "low." Altough this scale is not identical to that used in the present study, it is sufficiently similar that calculation of rating scores (using 'high priority' = 100, 'medium priority' = 50, and 'low priority' = 0) for comparison purposes has some legitimacy. The adequacy of this scoring can be estimated by comparing the mean and standard deviation of Call and Hayes' re-scored data to current AIN data for the 22 nutrients rated both times to determine whether they appear to share a common metric. The mean scores differ very little (52.5 in 1970 and 53.0 now) and the standard deviations are quite close (16.25 vs. 18.23) and thus it is clear that the scores may be compared without undue violence to the data (Heimbach and Stokes, 1981, p. 5).

CHAPTER IV

ANALYSIS OF DATA

Herein, this chapter contains the results and discussion of the study conducted to determine the nutrition labeling practices and attitudes of dietitians in management, the extent of any relationship(s) that exist between these professional practices, the dietitians' perceived goals for nutrition labeling, as well as their valuation of nutrients and health-related diseases. The results of this study are then compared to the studies done by Call and Hayes (1970) and Heimbach and Stokes (1979, 1981).

Demographic Description of Sample

Members of the ADA, who belonged to the four DPG (DIBI, CUF, SFS, HCDS), comprising the Division of Management Practices, participated in this study. Eighty members were systematically selected from the respective DPG 1981 mailing label computer print-outs. A total possible sample of 320 resulted. Of this sample: one CUF subject had retired; one had been a member of the DIBI and SFS group--the subject returned the DIBI survey unanswered since the subject had been concomitantly selected to represent both DPG and received the SFS survey first; three DIBI, one SFS, and one CUF members returned their surveys unanswered because their current professional positions disqualified them. Of the consequent "known", qualified, 312 dietitians in management, 125 (40.1

percent) responded to the questionnaire. Of the 80 surveys mailed to each practice group, 57.7 percent CUF, 38.0 percent SFS, 37.3 percent DIBI, and 31.3 percent HCDS answered the questionnaire (Table I).

TABLE I

DIETITIANS IN MANAGEMENT SURVEYED

DPG	Questionnaires Mailed (Adjusted for Disqualified Returns)	Questionnaires Returned N	Response Rate %
CUF	80-2 = 78	45	57.7
SFS	80-1 = 79	30	38.0
DIBI	80-5 = 75	28	37.3
HCDS	80-0 = 80	25	31.3
Total	312	128	41.0

The 1981 FDA survey to nutrition professionals experienced the following:

> The overall response rate of 22% is not impressive, although such low rates are not unusual with mail surveys, particularly when the questionnaire is as long and complex as this one was. The response rate from AIN members was 30%, considerably better than that from the food industry (18%) or consumers (12%) (Heimbach and Stokes, 1981, p. 3).

Thus, although the researcher's overall return rate was objectively low, comparatively it was significantly higher than the 1981 FDA survey. This significant difference becomes enhanced when one considers that the

researcher's questionnaire closely paralleled the 1981 FDA survey--including demographic and adapted questions from the 1978 FDA survey and various other sources--making it twice as long as the 1981 FDA survey.

Age

The dietitians' age ranged from 22 to over 50. Over 60.0 percent of the dietitians surveyed were 39 years of age, or younger (Table II).

TABLE II

AGE RANGE OF DIETITIANS IN MANAGEMENT

Range	Dietitians	
	N	Percent
22-29	43	33.6
30-39	38	29.7
40-49	23	17.9
50 and over	24	18.8
Total	128	100.00

Sex

Traditionally a predominately female profession, the survey results indicated that this is still true, even in the area of management. Over 90.0 percent of the dietitians responding to the survey were female (Table III).

TABLE III

SEX DISTRIBUTION OF DIETITIANS IN MANAGEMENT

Sex	Total Sample		CUF		SFS		DIBI		HCDS	
	N	%	N	%	N	%	N	%	N	%
Female	119	93	40	88.9	29	97.0	25	89.3	25	100
Male	9	7	5	11.1	1	3.0	3	10.7	0	0
Total	128	100.0	45	100.0	30	100.0	28	100.0	25	100.0

Employment

The dietitians that returned the survey were predominately full-time employees. Those that classified themselves as "unemployed" stated they had recently retired, or were in-between jobs (Table IV).

TABLE IV

EMPLOYMENT STATUS OF DIETITIANS IN MANAGEMENT

Status	Dietitians	
	N	%
Full Time	109	85.1
Part Time	12	9.4
Not Employed	7	5.5
Total	128	100.0

Years of Employment

The dietitians' years of employment ranged from one to more than ten years, in their present position. The majority of dietitians had worked for only "1-3 years" in their present positions (Table V).

TABLE V

YEAR OF EMPLOYMENT OF DIETITIANS IN MANAGEMENT

Range	Dietitians	
	N	%
1 - 3	73	57.0
4 - 6	14	11.0
7 - 9	11	8.6
10 or more	27	21.1
Unanswered	3	2.3
Total	128	100.0

Number of Previous Professional Positions

The dietitians' number of previously held professional positions, in the area of dietetics, ranged from 1 to more than five years. Compared to the data from Tables II and V, one can deduce that the highest percentage of dietitians surveyed were "22-29 years" old, have only worked in their present position for "1-3 years", and have had only "1-2 previous professional positions" (Table VI).

TABLE VI

PREVIOUS PROFESSIONAL POSITIONS OF DIETITIANS IN MANAGEMENT

Range	Dietitians	
	N	%
1 - 2	70	54.7
3 - 4	33	25.8
5 or more	22	17.2
Unanswered	3	2.3
Total	128	100.0

Educational Level

All the dietitians completed "undergraduate education", except one who had an associate degree, which was not counted when this question was used in the data analysis. Forty-four of the dietitians had completed a "master's" degree. Dietitians who were working on completing their "master's" degree were classified as having completed the "undergraduate" degree only. There were only two dietitians that held "doctorate" degrees, and none indicated that they were in the process of pursuing such degrees (Table VII).

Professional Organization Affiliations

All the dietitians were members of the "ADA", with 92.2 percent classified as registered dietitians. None of the dietitians surveyed were "American Institute of Nutrition (AIN)" or "American Society of

Clinical Nutrition (ASCN)" members, which are more research, clinical, and teaching orientated. Memberships in "other" nutrition organizations consisted of 7.8 percent belonging to a "specialized" organization, and an equal percentage belonging to a "city" organization, 5.5 percent belonging to a "state" organization, 3.9 percent belonging to a "national" organization, and 1.6 percent to an "international" organization (Table VIII).

TABLE VII

EDUCATION OF DIETITIANS IN MANAGEMENT

Degree and Area of Concentration	Dietitians	
	N	%
Baccalaurate Degree	81	63.8
Dietetics &/or Food & Nutrition	49	38.6
Institution Administration	4	18.9
Hotel & Restaurant Administration	4	3.1
Food Science	2	1.6
Other	2	1.6
Graduate - Master's Degree	44	34.6
Dietetics &/or Food & Nutrition	23	18.1
Institution Administration	10	7.9
Other	9	7.0
Food Science	1	0.8
Hotel & Restaurant Administration	1	0.8
Graduate - Doctorate Degree	2	1.6
Dietetics &/or Food & Nutrition	1	0.8
Institution Administration	1	0.8
Associate Degree	1	not included in analysis
Total	127	100.0

TABLE VIII

PROFESSIONAL ORGANIZATION AFFILIATIONS
OF DIETITIANS IN MANAGEMENT

Organizations	Dietitians	
	N	%
ADA, RD	118	92.2
ADA, not an RD	10	7.8
	128	100.0
Other [1]	34	26.6
ASFSA	29	22.7
NRA	21	16.4
NACUFS	20	15.6
AHEA	17	13.3
SNE	15	11.7
ASHFSA	13	10.2
ASPEN	3	2.3
IFT	3	2.3
AIN	0	0
ASCN	0	0
Total	145[2]	121.1[2]

[1]Included specialized, city, state, national and internation organizations.

[2]Many dietitians maintained multiple memberships.

ADA Membership Route

The majority of dietitians surveyed obtained their ADA membership through the "internship route". The remaining routes are listed as follows, beginning with the most predominent: "masters plus work experience"; "coordinated undergraduate program (CUP)"; "three-year preplanned experience"; "traineeship"; and one person whose route was "years of

experience". When the numbers of those dietitians with "master's degrees (N = 44) are compared to those that went the master's route (23), then it is seen that 52.3 percent of those having the "master's" degree utilized this as a route to ADA membership (Table IX).

TABLE IX

DIETITIANS IN MANAGEMENT'S ROUTES TO ADA MEMBERSHIP

Route	Dietitians	
	N	%
Internship	63	49.2
Masters plus work experience	23	17.9
Coordinated undergraduate program	18	14.1
Three year preplanned experience	12	9.4
Traineeship	10	7.8
"Years of experience"	1	.8
Unanswered	1	.8
Total	128	100.0

Institutional Data

Types of institutions included "residence halls", "student unions", "various acute and long term care hospitals", "schools" containing grades from kindergarten to 13, "government and state offices", "consulting sulting firms" and "food contracting companies", as well as

"magazines" and " retail food sales companies". Since the dietitians were so scattered among the various institutions, the researcher decided to use the DPG affiliations when the analyses called for this demographic variable.

The type of food service system had no significant effect in the final analysis. However, 71.1 percent of the dietitians classified their system as "conventional", and 3.1 percent as "assembly-serve" and "commissary systems". Combination food service systems of "conventional and commissary" received 3.1 percent, and "conventional and assembly-serve" received 1.6 percent.

Of those dietitians that felt the question of profit/nonprofit applied to them, 21.9 percent said their "institution/department operated for profit", and 43.7 percent said their "institution/ department did not operate for profit". Within the SFS group, 60.0 percent received "0-24 percent" of their total food inventory government subsidized, 23.3 percent received "24-49 percent" subsidized, and only 10.0 percent received "50 percent" or more of their total food inventory subsidized by the government. Of these subsidies, 66.7 percent were received in the form of "commodities", 16.7 percent received in the form of "financial support in lieu of commodities", and 6.6 percent received "other" forms of government subsidies. The type of feeding program administered most often was the "reimbursable meal", at 80.0 percent, followed by the "breakfast program" at 53.3 percent, and the "summer feeding" program at 30 percent.

Only 8.6 percent of the dietitians indicated that their foodservice department was contracted to a food management company, and only 9.4 percent indicated that they conducted computerized nutrition analyses of

their menus. The vast majority of the dietitians surveyed were employed in self-managed food service systems.

Evaluation of the Hypotheses

Seven hypotheses were postulated for this study. Analyses of the first five are included in this section. The hypotheses are as follows:

H_1: There will be no significant difference in the values assigned to specified nutrients by dietitians in management as associated with selected personal and institutional attributes.

H_2: There will be no significant difference in the times during the meal planning, procurement, and food production that dietitians in management utilize nutrition labeling information, as associated with selected personal and institutional attributes.

H_3: There will be no significant difference in the nutrition labeling information format preferences of dietitians in management as associated with selected personal and institutional attributes.

H_4: There will be no significant difference in the valuation of various diet-related health problems, and their application to nutrition labeling information of dietitians in management as associated with selected personal and institutional attributes.

H_5: There will be no significant difference in nutrition labeling goals of dietitians in management as associated with selected personal and institutional attributes.

The researcher rejected all of these hypotheses, because significant variates were discovered which related each of them as associated with the selected personal and institutional attributes they were tested against, up to the .05 level of significance.

Personal Data Variates

Age. A significant association was found between the dietitians' ages and variates in the pertinent hypotheses with the exception of

those in H_3. All the age groups felt strongest that they had "a lot of impact" on "developing food bid specifications," with the age group of "50 or more" indicating this at the highest percentage, 81.0. Likewise, all the age groups felt strongest that they had "a lot of impact" on "determining amounts of various foods to be purchased." The youngest age group of "22-29", however, indicated this at the highest percentage, 76.0.

Each of the age groups were in favor of the fact that nutrition information should be focused on facilitating total dietary planning and evaluation, by at least 68.0 percent. The "30-39 age group" supported this strongest, with 97.4 percent. The age groups were split on the question of whether food labels should contain information about specific substances not in the product. The two youngest groups were in favor of such information and the two older groups were opposed to such information. On the question that ranked the usefulness of "protein" information for consumers, all the age groups felt it to be "very useful", except the "22-29 age group", which favored the "of some use" response almost 2:1 (Table X).

Employment Status. The dietitians status of full, part-time, and unemployed had a statistical significance on variates in all the hypotheses, except H_5. Sixty-six percent of the full-time employees felt they had "a lot of impact" on the "amounts of various foods to be purchased," while only 52.0 percent of this same group felt they had "a lot of impact" on "determining specific brands of various foods to be purchased." In both cases the majority of dietitians employed part-time felt that they had at least "some impact" in both situations.

An almost equal split existed between the dietitians employed full time in their ranking of importance assigned to consideration of

TABLE X

BELIEF, PRACTICE AND ATTITUDE VARIATES BY AGE

Belief, Practice and Attitude Variates	Age
H_2: Impact that dietitians have on developing food bid specifications	$\chi^2 = 22.146$ df = 12 prob = .036
H_2: Impact that dietitians have on determining amounts of various foods to be purchased	$\chi^2 = 23.223$ df = 12 prob = .026
H_5: Should nutrition information be focused on facilitating total dietary planning and evaluation?	$\chi^2 = 11.626$ df = 4 prob = .020
H_4: Should food labels contain information about specific substances <u>not</u> in the product?	$\chi^2 = 10.246$ df = 4 prob = .037
H_1: Protein (C)[1]	$\chi^2 = 29.820$ df = 12 prob = .003

[1](C) = Consumers

nutrient content/information, when they "actually made purchasing decisions." Fifty and 49.0 percent were respectively assigned to the second and third priority rankings. All of the dietitians, regardless of employement status, ranked the "USDA Handbook #8 (or current revised editions)" most often as a "very useful" nutrition information format. Likewise, all of them ranked the usefulness of their "educational text references'" format most often as "of some use."

Concerning the question of whether food labels should contain information about specific substances not in the product, 55.9 percent of the dietitians employed full time, and 75.0 percent of them employed part-time, were in favor of this proposition. Interestingly, 85.7 percent of those dietitians not employed were not in favor of this propo sition. The only significant nutrient was the usefulness of "carbohydrates which are starches", to dietitians. The dietitians employed full time had a fairly even spread across the rankings "of some use", "very useful", and "of little or no use", which were respectively 38.1, 32.0, and 29.9 percentages (Table XI).

Years of Employment. Variates in all the pertinent hypotheses, except H_4, showed a statistical significance associated with the number of years that the dietitians had been employed in their present position. As seen in Table XII, all of the dietitians ranked the usefulness of "nutrition qualities" information in food bid specifications as "very useful" most frequently--except those that were in the "4-6 years of employment" group. The "7-9 years of employment" group felt the strongest about this with 80.0 percent ranking it as "very useful." The highest percentage of the "4-6 years of employment" group, 50.0, ranked this

TABLE XI

PRACTICE AND ATTITUDE VARIATES BY FULL OR PART-TIME EMPLOYEE

Practice and Attitude Variates	Full or Part-Time Employee
H_2: Impact that dietitians have on the amounts of various foods to be purchased.	$\chi^2 = 14.269$ df = 6 prob = .027
H_2: Impact that dietitians have on determining specific brands of various foods to be purchased.	$\chi^2 = 17.722$ df = 6 prob = .007
H_2: Nutrient content/information considered most when actually making purchasing decisions.	$\chi^2 = 27.246$ df = 6 prob = .0001
H_3: Usefulness of the USDA Handbook #8 (or current editions).	$\chi^2 = 15.754$ df = 6 prob = .015
H_3: Usefulness of educational text references format.	$\chi^2 = 15.433$ df = 6 prob = .017
H_4: Should food labels contain information about specific substrances not in the product?	$\chi^2 = 6.855$ df = 2 prob = .033
H_1: CHO[1]-Starches (D)[2]	$\chi^2 = 13.180$ df = 6 prob = .040

[1]CHO = Carbohydrates

[2](D) = Dietitians

TABLE XII

BELIEF, PRACTICE, AND ATTITUDE VARIATES BY YEARS OF EMPLOYMENT

Belief, Practice and Attitude Variates	Years of Employment
H_2: Usefulness of "nutritional qualities" information in developing food bid specifications.	$\chi^2 = 21.277$ df = 9 prob = .012
H_3: Usefulness of piechart made of nutrient data presentation.	$\chi^2 = 21.843$ df = 9 prob = .009
H_3: Usefulness of a statement of measured units of nutrient data presentation.[1]	$\chi^2 = 16.105$ df = 9 prob = .065
H_3: Usefulness of "other"[2] reference books' formats.	$\chi^2 = 7.875$ df = 2 prob = .019
H_5: Should nutrition information be focused on facilitating total dietaryp lanning and evaluation.[1]	$\chi^2 = 6.988$ df = 3 prob = .072
H_3: Preferred method of analysis for nutrition labeling information.[1]	$\chi^2 = 6.774$ df = 3 prob = .079
H_3: Preferred method of displaying information about sugars.	$\chi^2 = 16.797$ df = 9 prob = .052
H_1: CHO[3]-Fiber (D)[4]	$\chi^2 = 13.100$ df = 6 prob = .042
H_1: Polyunsaturated Fat (D)	$\chi^2 = 17.080$ df = 9 prob = .048
H_1: Potassium (C)[5]	$\chi^2 = 20.703$ df = 9 prob = .014
H_1: Saturated Fat (D)	$\chi^2 = 13.008$ df = 6 prob = .043

[1]Included because a pertinent, moderately significant datum.

[2]4:1 was Bowes and Church Handbook of Food Portions.

[3]CHO = Carbohydrates

[4](D) = Dietitians

[5](C) = Consumers

information as only "of some use."

The dietitians employed for "7-9 years" had an even split between their rankings of the usefulness of the "pie chart" mode of nutrient data presentation. "Very useful" and "of some use" both received 45.5 percent of their rankings. All the other years of employment groups had the highest ranking in the "of some use" category. All of the dietitians, regardless of years of employment in their present position, predominately ranked the "statement of measured units" mode of nutrient data presentation as "very useful." This preference became more distinct as the years of employment increased, from 37.3 percent by the "1-3 years of employment" group, to 50.0 percent for the "10 or more years of employment" group.

Of the "other" reference sources of nutrition information listed by the "1-3" and "7-9 years of employment" group, all were considered "very useful" formats. The "4-6 years of employment" group had an even percentage split between "very useful" and "of some use." The researcher also noted that dietitians in "10 or more years of employment" group did not list any "other" sources.

All the dietitians, regardles of years of employment in their present position, were in favor of nutrition information that was focused on facilitating total dietary planning and evaluation. The preference became more distinct as the years of employment decresed, from 73.1 percent for the "10 or more years of employment" group, to 92.9 percent for the "1-3 years of employment" group.

Dietitians, who had worked from 4-10 or more years in their present position, favored the "recipe method" of calculation by the manufacturer, to obtain nutrition labeling information for standard products, by at

least 52.0 percent. Those dieititans who had only worked from "1-3 years" in their present position, favored the manufacturers' "analysis of the 'as used' product" method by 65.2 percent.

All of the dietitians preferred that the presentation of sugar information in labeling be of "the total amount of sugars from all ingredients--both sugar naturally present in the product and sugars which have been added to the product." Some wrote on the surveys that they would actually prefer the display method of "total sugars from all ingredients broken out by type of sugar", but realized the education and cost factors involved, and so chose the previously stated method.

The general trend, of dietitians' rankings of the significant nutrients in Table XII, was as follows. The "4-6 years of employment" group principally ranked them "of little or no use", the "1-3 and 7-9 groups" ranked them highest "of some use", and the "10 or more years" group ranked them all as "very useful."

Number of Previous Professional Positions. The amount of previous professional positions in the area of dietetics, that the dietitians had held prior to their present position, had a statistical significance on variates in all the hypotheses, except H_5 (Table XIII). Regardless of the number of previous professional positions that the dietitians had held, prior to their present position(s), the majority of them felt that they had "a lot of impact" on "determining specific brands of various foods to be purchased." An overwhelming majority in each group felt that "count" information was "very useful" in food bid specifications.

The dietitians that had held "1-2" and "5 or more previous professional positions" ranked the "statement of measure units" mode of nutrition information highest as "very useful" to them, in the planning/

TABLE XIII

PRACTICE AND ATTITUDE VARIATES BY NUMBER OF PREVIOUS POSITIONS

Practice and Attitude Variates	Number of Previous Positions	Practice and Attitude Variates	Number of Previous Positions
H_2: Impact that dietitians have on determining specific brands of various foods to be purchased.	χ^2 = 12.998 df = 6 prob = .043	H_1: Copper (C)	χ^2 = 16.081 df = 6 prob = .013
H_2: Usefulness of "count" information in the development of food bid specifications.	χ^2 = 13.740 df = 6 prob = .033	H_1: Molybdenum (C)	χ^2 = 13.789 df = 6 prob = .032
H_3: Usefulness of a statement of measured units mode of nutrient data presentation.	χ^2 = 13.740 df = 6 prob = .033	H_1: Phosphorous (C)	χ^2 = 14.798 df = 6 prob = .022
H_4: Should food labels contain information about specific substances <u>not</u> in the product?	χ^2 = 7.094 df = 2 prob = .029	H_1: Selenium (C)	χ^2 = 16.603 df = 6 prob = .011
H_1: Calcium (C)[1]	χ^2 = 12.724 df = 6 prob = .048	H_1: Sodium (C))	χ^2 = 16.412 df = 6 prob = .012
H_1: Chromium (C)	χ^2 = 16.053 df = 6 prob = .014	H_1: Zinc (C)	χ^2 = 12.765 df = 6 prob = .047

[1](C) = Consumers

procurement of foods. Those who had held "3-4 previous professional positions" indicated a 46.7 percent favor for the ranking "of some use." Nevertheless, the general trend for preferences to become more distinct, with the number of previous professional positions held, paralleled that of the increasing years of employment variable trend.

Concerning the question of whether food labels should contain information about specific substances not in the product, those dietitians who had held the least number of professional positions favored this proposition, by 67.6 percent. A 59.4 percent did not favor this proposition among the "3-4 positions" group, and those dietitians who had held the most numerous professional positions were evenly divided on the question.

As for the significant nutrients in Table XIII, the highest percentage of dietitians ranked all of them "of little or no use", except for "sodium" and "calcium" information for consumers' use. The former nutrient was ranked "very useful", and the latter one was predominately ranked "of some use" by all the dietitians, except those who had held "3-4 previous positions"--they favored "very useful", in regards to information on "calcium".

Educational Background. The highest educational degree obtained by the dietitians only had a statistical significance on variates in H_4 and H_5 (Table XIV). Regardless of the highest degree obtained, by far the largest majority of dietitians always favored nutrition information that focused on aiding consumers in making product comparisons, and the proposition that the Government should allow health or disease-related truthful claims to be made on the food label. Of the dietitians with

TABLE XIV

BELIEF AND ATTITUDE VARIATES BY HIGHEST DEGREE

Practice and Attitude Variates	Highest Degree
H_4: Should food labels contain information about substances <u>not</u> in the product?	$\chi^2 = 6.216$ dg = 2 prob = .045
H_5: Should nutrition information be focused on aiding consumers make product comparisons?	$\chi^2 = 7.672$ df = 2 prob = .022
H_4: Should Government allow health or disease-related claims on the food label?[1]	$\chi^2 = 5.664$ df = 2 prob = .059

[1]Included because a pertinent, closely significant datum.

only an "undergraduate education", 51.3 percent were not in favor, of allowing information about specific substances not in the product, included on the food label. Dietitians that had a "master's" favored this proposition by 72.1 percent, and those holding "doctorate" degrees were evenly divided on the question. When the dietitians specified examples of labeling claim topics they would be in favor of--in the questions referring to health or disease-related truthful claims, and claims about substances not in the product--many of their examples overlappped. They included the following areas of concerns, in descending priority order: "sodium, iodine, no sugar and/or reduced calories; cholesterol; saturated fat and/or not fat free; vitamin C, iron, and protein and/or protein analog content; fiber content; and potassium content."

"Institution administration" was the only "undergraduate" degree major that had any statistical significance on hypotheses on variates. Those included related only to H_1, H_3, and H_5. Dietitians with the highest degree in the are of "institution administration", at the "undergraduate" level, favored the concept that nutrition information should be focused on aiding consumers in making product comparisons, by 91.7 percent. These dietitians also favored the display method of "the amount of carbohydrates from sugars and starches each shown separately along with the total amount of carbohydrates, plus a separate declaration of fiber content", by 71.4 percent. Of the significant nutrients in Table XV, all were give the majority rank "of little or no use."

The "doctorate" degree had no statistical significance related to any of the variates in the pertinent hypothese. Through the combined analysis of "master's" degrees, those in: "food science; institution

TABLE XV

BELIEF AND ATTITUDE VARIATES BY BS DEGREE IN INSTITUTIONAL ADMINISTRATION

Belief and Attitude Variates	BS Degree in Institution Administration
H_5: Whether nutrition information should be focused on aiding consumers in making product comparisons.	$\chi^2 = 7.639$ df = 1 prob = .006
H_3: Preferred method of displaying carbohydrate data.	$\chi^2 = 6.635$ df = 2 prob = .036
H_1: Biotin (D)[1]	$\chi^2 = 8.471$ df = 3 prob = .037
H_1: Choline/Lecithin (D)	$\chi^2 = 8.471$ df = 3 prob = .037
H_1: Inositol (C)[2]	$\chi^2 = 8.471$ df = 3 prob = .037
H_1: Selenium (D)	$\chi^2 = 8.471$ df = 3 prob = .037

[1](D) = Dietitians

[2](C) = Consumers

administration; hotel and restaurant administration"; and "other" degrees, including "education and/or home economics education, counseling, and public health" were the only "graduate" degrees found that had a statistical significance on all of the hypotheses (Tables XVI-XX).

Of the dietitians with a "master's" degree in "dietetics and/or food and nutrition", 56.0 percent indicated that they had "a lot of impact" on "determining amounts of various foods to be purchased." They also strongly supported, by 95.7 percent, the fact that nutrition information should be focused on facilitating total dietary planning and evaluation (Table XVI).

The dietitian with a "master's" degree in "food science" indicated that he/she had "not much impact" on "determining amounts of various foods to be purchased." Their ranking of the usefulness of "color" and "nutritional qualities" information, in food bid specifications, was predominately "of little use." This dietitian also said "no", to the questions of whether nutrition information shuld be focused on facilitating total dietary planning and evaluation, and whether labeling should contain information on proper handling and preparation of foods for optimal retention of nutritional quality. Accordingly, their ranking of the significant nutrients in Table XVII, were all most frequently "of little or no use."

Of the dietitians who indicated they had a "master's" degree in "institution administration", 42.9 percent felt they had "some impact" on "developing food bid specifications." An even split existed among them in their preferred method of declaring the micronutrients. Thirty percent wanted "measuring units/100 grams", and an equal percentage wanted "measuring units/serving." The remaining choices received 10.0

TABLE XVI

BELIEF AND PRACTICE VARIATES BY MS DEGREE IN DIETETICS AND/OR FOOD & NUTRITION

Belief and Practice Variates	MS Degree in Dietetics and/or Food and Nutrition
H_2: Impact that dietitians have on determining amounts of various foods to be purchased.	$\chi^2 = 9.060$ df = 3 prob = .029
H_5: Whether nutrition information should be focused on facilitating total dietary planning and evaluation.[1]	$\chi^2 = 3.287$ df = 1 prob = .069

[1]Included because a pertinent, moderately significant datum.

TABLE XVII

BELIEF, PRACTICE, AND ATTITUDE VARIATES BY MS DEGREE IN FOOD SCIENCE

Belief, Practice, and Attitude Variates		MS Degree in Food Science
$H2_:$	Impact that dietitians have on determining amounts of various foods to be purchased.	$\chi^2 = 11.314$ df = 3 prob = .010
H_2:	Usefullness of "color" information in food bid specifications.	$\chi^2 = 8.980$ df = 3 prob = .029
H_2:	Usefulness of "nutritional qualities" information in food bid specifications.	$\chi^2 = 8.980$ df = 3 prob = .029
H_5:	Whether nutrition information should be focused on facilitating total dietary planning and evaluation.	$\chi^2 = 6.648$ df = 1 prob = .009
H_5:	Whether information on proper handling and preparation of foods on labeling would be used as an educational tool for employees.	$\chi^2 = 10.233$ df = 1 prob = .001
H_1:	Calcium (D)[1]	$\chi^2 = 7.981$ df = 3 prob = .046
H_1:	Iron (C)[2]	$\chi^2 = 7.981$ df = 3 prob = .046
H_1:	Sodium (C)	$\chi^2 = 7.981$ df = 3 prob = .046

[1](D) = Dietitians

[2](C) = Consumers

percent each. These dietitians also preferred, by 80.0 percent, that the presentation of sugar information be "the total amount of sugars from all inredients--both sugar naturally present in the product and sugars which have been added to the product." They also indicated that a large majority, 66.7 percent, were in favor of nutrition information that focused on facilitating total dietary planning and evaluation.

The dietitians in this group reaffirmed their preference for simplified sugar information, when 55.6 percent ranked information for dietitians's use, about "carbohydrates which are sugars", as "of little or no use". "Fat" information, for consumers' use, was evenly ranked 40.0 percent as, "very useful", and "of some use." The remaining significant nutrients in Table XVIII, were principally ranked "of some use".

The dietitian with a "master's" degree in "hotel and restaurant administration" ranked all the significant nutrients in Table XIX, "of little or no use," except "calorie" information, for consumers' use. The latter nutrient information was ranked "of some use".

The "other master's" degrees included seven "education and/or home economics education", one "counseling", and one "public health". Since the majority were in the area of "education", the researcher focused on those results. These dietitians were predictably in favor of the use of labeling information on proper handling and preparation of foods as an educational tool for employees, by 85.7 percent.

The majority of them, 66.7 percent, ranked the "statement of measured units" as "of some use", as a mode of nutrient data presentation. Also, 71.4 percent of them did not favor food labels that contained information about specific substances <u>not</u> in the product.

TABLE XVIII

BELIEF, PRACTICE, AND ATTITUDE VARIATES BY MS DEGREE IN INSTITUTION ADMINISTRATION

Belief, Practice and Attitude Variates	MS Degree in Institution Administration
H_2: Impact that dietitians have on developing food bid specifications.	$\chi^2 = 8.349$ df = 3 prob = .039
H_3: Preferred method of declaring micronutrients.	$\chi^2 = 25.220$ df = 5 prob = .0001
H_3: Preferred method of displaying information about sugars.	$\chi^2 = 7.749$ df = 3 prob = .052
H_5: Whether nutrition information should be focused on facilitating total dietary planning and evaluation.	$\chi^2 = 3.894$ df = 1 prob = .049
H_1: CHO[1]-Sugars (D)[2]	$\chi^2 = 7.078$ df = 2 prob = .029
H_1: Fat (C)[3]	$\chi^2 = 12.584$ df = 3 prob = .006
H_1: Iron (D)	$\chi^2 = 8.625$ df = 3 prob = .035
H_1: Protein (D)	$\chi^2 = 6.720$ df = 2 prob = .035
H_1: Sodium (D)	$\chi^2 = 7.790$ df = 3 prob = .051

[1]CHO - Carbohydrates

[2](D) = Dietitians' rating for themselves.

3(C) = Dietitians' rating for consumers.

TABLE XIX

ATTITUDE VARIATES BY MS DEGREE IN HOTEL AND RESTAURANT ADMINISTRATION

	Attitude Variates	MS Degree in Hotel and Restaurant Administration
H_1:	Calcium (C)[1]	$\chi^2 = 7.981$ df = 3 prob = .046
H_1:	Calories (C)	$\chi^2 = 10.232$ df = 1 prob = .001
H_1:	Fat (C)	$\chi^2 = 7.781$ df = 3 prob = .051
H_1:	Iron (C)	$\chi^2 = 7.981$ df = 3 prob .046
H_1:	Polyunsaturated Fat (C)	$\chi^2 = 9.982$ df = 3 prob = .019
H_1:	Protein (D)[2]	$\chi^2 = 8.730$ df = 2 prob = 013
H_1:	Saturated Fat (C)	$\chi^2 = 9.982$ df = 3 prob = .019
H_1:	Sodium (C)	$\chi^2 = 7.981$ df = 3 prob = .046

[1](C) = Consumers

[2](D) = Dietitians

Concerning the significant nutrient variables, in Table XX for consumers' use: the highest percentage of these dietitians ranked all of the following as "don't know enough"--"biotin, coppper, folacin, inositol, molybdenum, pantothenic acid, selenium, and zinc"; they broke even on the highest percentages who ranked the following nutrients "of little or no use", and "don't know enough"--"chromium and manganese." As for the nutrient information, for their own use, all of the following nutrients received the majority rank "of some use"--"choline/lecithin, chromium, copper, and selenium."

Professional Organizations. The dietitians surveyed indicated, as shown in Table VIII, that they maintained memberships with ten of the twelve major, national nutrition organizations listed in the survey, as well as "other" nutrition organizations. Of those organizations showing affiliations with the dietitians surveyed, only eight membership classifications produced statistical significance, but these related to variates from all the pertinent hypotheses (Tables XXI-XXVIII).

The researcher believed that a breakdown of the responses was important for the "ADA members", because all of the dietitians surveyed were members. The researcher specifically wanted to see if there existed any differences in answers, due to whether the dietitians were registered or not.

Concerning the rankings they assigend to their "educational text references", as a useful nutrition information format, 55.6 percent of the "non-RD members" thought they were "of some use", and 33.3 percent "very useful." Of the "RD members", 55.1 pecent ranked this format "of some use", and 20.2 percent ranked it "very useful." The majority, 55.6 percent, of "non-RD members" ranked the format usefulness of "reference

TABLE XX

BELIEF, PRACTICE AND ATTITUDE VARIATES BY MS IN "OTHER"[1] DEGREES

Belief, Practice and Attitude Variates	MS in "Other" Degrees	Belief, Practice and Attitude Variates	MS in "Other" Degrees
H_5: Whether information on proper handling & preparation of foods on labeling would be used as an educational tool for employees.	χ^2 = 19.664 df = 3 prob = .0002	H_1: Copper (D)	χ^2 = 20.742 df = 12 prob = .054
		H_1: Folacin (C)	χ^2 = 23.112 df = 12 prob = .027
H_3: Usefulness of a statement of measured units as a mode of nutrient data presentation.	χ^2 = 32.146 df = 15 prob = .006	H_1: Inositol (C)	χ^2 = 26.542 df = 12 prob = .009
H_4: Should food labels contain information about specific substances not in the product?	χ^2 = 10.989 df = 5 prob = .052	H_1: Manganese (C)	χ^2 = 30.815 df = 12 prob = .002
H1: Biotin (C)[2]	χ^2 = 31.486 df = 12 prob = .002	H_1: Molybdenum (C)	χ^2 = 32.464 df = 12 prob = .001
H_1: Choline/lecithin (D)[3]	χ^2 = 25.101 df = 12 prob = .014	H_1: Pantothenic Acid	χ^2 = 21.767 df = 12 prob = .040
H_1: Chromium (C)	χ^2 = 30.443 df = 12 prob = .002	H_1: Selenium (C)	χ^2 = 32.383 df = 12 prob = .001
H_1: Chromium (D)	χ^2 = 20.742 df = 12 prob = .054	H_1: Selenium (D)	χ^2 = 20.742 df = 12 prob = .054
H_1: Copper (C)	χ^2 = 32.373 df = 12 prob = .0012	H_1: Zinc (C)	χ^2 = 25.849 df = 12 prob = .011

[1] Includes: 7 Education and Home Economics Education, 1 Counseling, 1 Public Health.

[2] (C) = Consumers

[3] (D) = Dietitians

books made available by the food manufacturer(s)" as "of some use", while 33.3 percent ranked it as "very useful". The "RD members" ranked this format as "of some use" 44.9 percent, and "very useful" received 36.7 percent. The "RD members" listed "other" reference sources more often, and 93.8 assigned "very useful" to these specified formats. The "non-RD members" were evenly split on their perceived usefulness of "other" references cited.

Of the dietitians surveyed, 63.8 percent of the "RD members" felt they had "a lot of impact" on "determining amounts of various foods to be puchased". In contrast, 55.6 percent of the "non-RD members" felt they had only "some impact" in the area, and only 33.3 percent felt they actaully had "a lot of impact".

The significant nutrients, in Table XXI, showed that the "RD members" had more marked opinions than the "non-RD members", and they consistently ranked the nutrients' usefulness higher than "non-RD members." "Fat" information, for consumers' use, was the only nutrient receiving a majority rank of "very useful." This was done by the "RD members", who also thought that information of "molybdenum and phosphorous", for their use, was predominately "of little or no use".

American School Food Serivce Association Members. These dietitians felt they had "a lot of impact" on "developing food bid specifications", and "determining specific brands of various foods to be purchased". They also indicated, by 70.4 percent, that nutrient content/information of food(s) was considered the most when "writing menus". As well, 38.1 percent considered nutrient content/information of food(s) most when "developing food specifications for vendors/brokers". The latter time, when nutrient content/information is considered most, was also

TABLE XXI

PRACTICE AND ATTITUDE VARIATES BY ADA[1] MEMBERS

Practice and Attitude Variates		ADA Members
H_3:	Usefulness of educational text references format.	$\chi^2 = 7.923$ df = 3 prob = .048
H_3:	Usefulness of food manufacturer(s) references' formats.[2]	$\chi^2 = 6.896$ df = 3 prob = .075
H_3:	Usefulness of "other"[3] reference books' formats.	$\chi^2 = 7.380$ df = 3 prob = .061
H_2:	Impact that dietitians have on determining amounts of various foods to be purchased.[2]	$\chi^2 = 7.380$ df = 3 prob = .061
H_1:	Fat (C)[4]	$\chi^2 = 8.819$ df = 3 prob = .032
H_1:	Molybdenum (D)[5]	$\chi^2 = 12.000$ df = 3 prob = .007
H_1:	Phosphorous (D)	$\chi^2 = 7.973$ df = 3 prob = .047

[1]American Dietetic Association

[2]Included because a pertinent, moderately significant datum.

[3]4:1 was Bowes and Church, Handbook of Food Portions.

[4](C) = Consumers

[5](D) = Dietitians

principally ranked as a second priority by 42.9 percent of the dietetic members of ASFSA. An overwhelming 82.1 percent of these members favored nutrition labeling that contained information on proper handling and preparation of foods for optimal retention of nutritional quality. Both the significant nutrients in Table XXII were predominately ranked "of little or no use". Surpisingly, "potassium" information, for consumers' use, had 39.3 percent rank it as "very useful", which was quite close to the 42.9 percent who had ranked it "of little or no use".

American Society of Hospital Food Service Administrators Members. This group wholeheartedly supported the proposition that the government should allow health or disease-related truthful claims on the food label. The only significant nutrient, that they sighted in Table XXIII, was "carbohydrates which are starches", for consumers' use. They most frequently ranked this as "of some use".

American Society For Parenteral and Enteral Nutrition Members. These are the nutritionists that would be most concerned with future regulations dealing with "medical foods", as discussed earlier in Chapter II (see pp. 41-42 and 54). Since they have to be so concerned about precise intakes of various nutrients, it is very interesting to see that 100 percent of these dietitians preferred the "recipe method" of calculation/analysis, to provide nutrition labeling information for standard products. They also preferred one of the lesser precise methods of declaring micronutrient - 66.7 percent chose "measuring units/serving".

Of the two significant nutrients, for consumers' use, that are shown in Table XXIV, the dietitians were evenly split on their ranking

TABLE XXII

BELIEF, PRACTICE AND ATTITUDE VARIATES BY ASFSA[1] MEMBERS

Belief, Practice and Attitude Variates	ASFSA Members
H2: Impact that dietitians have on developing food bid specifications.	$\chi^2 = 9.611$ df = 3 prob = .022
H_2: Impact that dietitians have on determining specific brands of various foods to be purcharsed.	$\chi^2 = 7.9740$ df = 3 prob = .047
H_2: Usefulness of "color" information in food bid specifications.	$\chi^2 = 11.952$ df = 2 prob = .003
H_2: Usefulness of "count" information in food bid specifications.	$\chi^2 = 9.398$ df = 3 prob = .024
H_5: Whether information on proper handling and preparations of foods on labeling would be listed as an educational tool for employees.	$\chi^2 = 4.763$ df = 1 prob = .029
H_1: Choline/Lecithin $(C)_1$	$\chi^2 = 7.884$ df = 3 prob = .049
H_1: Potassium (C)	$\chi^2 = 12.755$ df = 3 prob = .005

[1]American School Food Service Association

[2](C) = Consumers

TABLE XXIII

ATTITUDE VARIATES BY ASHFSA[1] MEMBERS

Attitude Variates	ASHFSA Members
H_4: Should the Government allow health or disease-related claims on the food label?	$\chi^2 = 3.942$ df = 1 prob .047
H_1: CHO[2] - Starches (C)[3]	$\chi^2 = 8.538$ df = 3 prob = .036

[1]American Society of Hospital Food Service Administrators

[2]CHO = Carbohydrates

[3](C) = Consumers

TABLE XXIV

ATTITUDE VARIATES BY ASPEN[1] MEMBER

Attitude Variates	ASPEN Member
H_3: Preferred method of analysis for nutrition labeling information.	$\chi^2 = 4.103$ df = 1 prob = .043
H_3: Preferred method of declaring the micronutrients.	$\chi^2 = 14.090$ df = 5 prob = .015
H_1: CHO[2] - Sugars (C)[3]	$\chi^2 = 12.295$ df = 3 prob = .006
H_1: Choline/Lecithin (C)	$\chi^2 = 7.707$ df = 3 prob = .053

[1]American Society for Parenteral & Enteral Nutrition.

[2]CHO = Carbohydrates

[3](C) = Consumers

of "choline/lecithin". This nutrient(s) was considered "very useful", and/ or perceived that consumers "don't know enough" about it. "Carbohydrates which are sugars" were considered to be mostly, "of little or no use".

National Association of College and University Food Service Members. Regarding the question of preferred method for declaration of micronutrients, 42.1 percent of these dietitians chose "measuring units/serving", and 31.6 percent chose the "present percentage of U.S. RDA/serving". Fifty percent of them declared that the "USDA Handbook #8 (or current revised editions)" was only "of some use", as a nutrition information format. The significant nutrients in Table XXV were both predominately ranked "of some use".

National Restaurant Association Members. A close tie existed between those members who thought they had "a lot of impact" on "determining amounts of various foods to be purchased", 42.1 percent, and those who thought they only had "some impact", 47.4 percent. In contrast, 51.6 percent of these dietitians felt they had "a lot of impact" on "determining specific brands of various foods to be purchased", and the next largest percentage ranking, 27.4, went to the dietitians who felt they had "no impact" in this area. Concerning the usefulness of "drained weight" information, in food bid specifications, 72.4 percent of these dietitians thought it was "very useful". The majority of them indicated that the significant "carbohydrate" information, for consumers' use, would be "very useful", while the remaining significant nutrients in Table XXVI were principally considered to be "of some use" to these dietitians.

TABLE XXV

PRACTICE AND ATTITUDE VARIATES BY NACUFS[1]

Practice and Attitude Variates	NACUFS Members
H_2: Preferred method of declaring the micronutrients.	$\chi^2 = 12.807$ df = 5 prob = .025
H_3: Usefulness of the USDA Handbook #8 (or current revised eds.)	$\chi^2 = 8.639$ df = 3 prob = .034
H_1: CHO[2] - Fiber (D)[3]	$\chi^2 = 6.678$ df = 2 prob = .036
H_1: Cholesterol (C)[4]	$\chi^2 = 10.953$ df = 3 prob = .012

[1]National Association of College & University Food Service.

[2]CHO= Carbohydrates

[3](D) = Dietitians

[4](C) = Consumers

TABLE XXVI

PRACTICE AND ATTITUDE VARIATES BY NRA[1] MEMBERS

Practice and Attitude Variates	NRA Members
H_2: Impact that dietitians have on determining amounts of various foods to be purchased.	$\chi^2 = 10.298$ df = 3 prob = .016
H_2: Impact that dietitians have on determining specific brands of various foods to be purchased.[2]	$\chi^2 = 7.334$ df = 3 prob = .062
H_2: Usefulness of "drained weight" information in food bid specifications.[2]	$\chi^2 = 7.145$ df = 3 prob = .067
H_1: Carbohydrates (C)[3]	$\chi^2 = 9.895$ df = 3 prob = .019
H_1: CHO[4] - Fiber (D)[5]	$\chi^2 = 6.617$ df = 2 prob = .037
H_1: Choline/Lecithin (D)	$\chi^2 = 10.412$ df = 3 prob = .015
H_1: Inositol (D)	$\chi^2 = 8.726$ df = 3 prob = .033
H_1: Molybdenum (D)	$\chi^2 = 8.585$ df = 3 prob = .035

[1]National Restaurant Association

[2]Included because a pertinent, moderately significant datum.

[3](C) = Consumers

[4]CHO = Carbohydrates

[5](D) = Dietitians

Society for Nutrition Education Members. The preferred method, by 71.4 percent of these members, to display carbohydrate information on food labeling, was "the amount of carbohydrates from sugars and starches each shown separately along with the total amounts of carbohydrates, plus a separate declaration of fiber content." In contrast, 69.2 percent, chose the less complicated method of nutrient information calculation/analysis--the "recipe method." These members ranked the usefulness of the "USDA Dietary Guidelines (or other food guides)" as "very useful", by 58.3 percent. Their ranking of the significant nutrient "vitamin E", in Table XXVII, was closely divided between those who considered it as "very useful", and those who considered it "of little or no use" to them.

"Other" Members. "Other" organizations included specialized, city, state, national, and international, as shown in Table VIII. The city, state, and specialized members predominately chose "just the amount of sugars which have been added to the product", as their top method choice, to display sugar data on food labels. The national and international members were closely divided between the above mentioned method, and the "total amount of sugars from all ingredients--both sugar naturally present in the product and sugars which have been added to the product" method.

City members were evenly divided on their rankings of "very useful", "of some use", an "of little or no use" for the "statement of measured units", as a useful mode of nutrient data presentation. State members predominately ranked it as a "very useful" mode, national members tied between the rankings "of little or no use", and "don't know

TABLE XXVII

ATTITUDE VARIATES BY SNE[1] MEMBER

Attitude Variates	SNE Member
H_3: Preferred method of displaying carbohydrate data.	$\chi^2 = 8.309$ df = 2 prob = .016
H_3: Preferred method of analysis for nutrition labeling information.	$\chi^2 = 4.145$ df = 1 prob = .042
H_3: Usefulness of the USDA Dietary Guidelines (or other food guides).	$\chi^2 = 6.826$ df = 2 prob = .033
H_1: Vitamin E (D)[2]	$\chi^2 = 7.674$ df = 3 prob = .053

[1]Society for Nutrition Education.

[2](D) = Dietitians

enough", and international and specialized members ranked it most often as "of some use." The significant nutrient in Table XXVIII, "phosphorous", was ranked "of little or no use", to consumers, by all the "other" organizational members, except international members. They were split between ranking it as "very useful" and declaring that consumers "don't know enough".

American Dietetic Association Membership Route. The route that the dietitians obtained their ADA membership had statistical significance on variates in all the pertinent hypotheses, except H_3 (Table XXIX). All the dietitians surveyed felt strongly that they had "a lot of impact" in determining amounts of various foods to be purchased, except those who had gone the "three-year preplanned experience", where the majority felt they had only "some impact". With the exception of the one dietitian whose route had been "years of experience", all the dietitians favored the proposition that nutrition information should be focused on facilitating total dietary planning and evaluation, by at least 70.0 percent.

Regarding the question of whether the Government should allow health or disease-related truthful claims on food labels, 60.0 percent of the "internship" route dietitians, 80.0 percent of the "traineeship" route dietitians, 77.3 percent of the "master's plus work experience" route dietitians, and the one "years of experience" route dietitian were in favor of this option. The majority of dietitians who went the "coordinated undergraduate program (CUP)", and "three-year preplanned experience" routes opposed this option, by 64.7 and 72.7 percent, respectively.

Except for those dietitians who went the "three-year preplanned experience" route, all of the dietitians thought that "calorie"

TABLE XXVIII

ATTITUDE VARIATES BY "OTHER" MEMBERSHIPS

Practice and Attitude Variates	"Other" Memberships[1]
H_3: Preferred method of displaying information about sugars.	$\chi^2 = 30.480$ df = 18 prob = .033
H_3: Usefulness of a statement of measured units as a mode of nutrient data presentation	$\chi^2 = 38.849$ df = 18 prob = .003
H_1: Phosphorus (C)[2]	$\chi^2 = 30.074$ df = 18 prob = .037

[1]Included city, state, national, international and specialized organizations.

[2](C) = Consumers

TABLE XXIX

BELIEF, PRACTICE AND ATTITUDE VARIATES
BY ROUTE OBTAINED ADA[1] MEMBERSHIP

Belief, Practice and Attitude Variates		Route Obtained ADA Membership
H_2:	Impact that dietitians have on determining specific amounts of foods to purchased.[2]	$\chi^2 = 23.337$ df = 15 prob = .077
H_4:	Should Government allow health or disease-related claims on the food label?	$\chi^2 = 14.068$ df = 5 prob = .015
H_5:	Should nutrition information be focused on facilitating total dietary planning and evaluation?	$\chi^2 = 13.802$ df = 5 prob = .017
H_1:	Calories (C)[3]	$\chi^2 = 18.049$ df = 10 prob = .054
H_1:	Calories (D)[4]	$\chi^2 = 18.749$ df = 10 prob = .044
H_1:	Vitamin K (D)	$\chi^2 = 26.707$ df = 15 prob = .031

[1]American Dietetic Association

[2]Included because a pertinent, moderately significant datum.

[3](C) = Consumers

[4](D) = Dietitians

information (for consumers' use), was "very useful", by at least 81.0 percent. Within the "three-year preplanned experience" group of dietitians, 58.3 percent indicated that this information was only "of some use" to consumers. In constrast, the majority of "internship, CUP, and traineeship" dietitians felt that "calorie" information ws "very useful", for their own use. The remaining dieititans ("master's plus work experience, three-year preplanned experience, and 'years of experience'" route members) indicated the highest rank for "calorie" information, for their own use, was only "of some use." None of the dietitians felt that information on "vitamin K" was "very useful" to them, the rankings gravitated fairly evenly between, "of some use", and "of little or no use."

Institutional Variables

Practice Group. The practice group variable was used in the place of institution type, because the responding dietitians were so sparsely scattered among the various types of institutions specified. For additional information on this topic refer to the section Institutional Data in this chapter (see pp. 79-82). Nevertheless, this variable only had a statistical significance on variates in H_1, H_2, and H_3 (Table XXX).

All of the dietitians indicated most often that they had "a lot of impact" on "determining specific brands of various foods to be purchased", except those in the "DIBI group", who most often indicated they had only "some impact" in this are. This fact could be contributed to the number of dietitians in this PG, whose status is classified as a consultant to food services, and they are located at staff, or higher, positions. These advisory positions would not ordinarily involve responsibilities of the day to day workings of an institution.

TABLE XXX

PRACTICE AND ATTITUDE VARIATES BY PRACTICE GROUP

Practice and Attitude Variates	Practice Group	Practice and Attitude Variates	Practice Group
H_2: Impact that dietitians have on determining specific brands of various foods to be purchased.	χ^2 = 24.790 df = 9 prob = .003	H_1: Fat (D)	χ^2 = 22.176 df = 9 prob = .008
H_3: Usefulness of the pie chart mode of nutrient data presentation.	χ^2 = 17.038 df = 9 prob = .048	H_1: Polyunsaturated Fat (D)	χ^2 = 17.211 df = 9 prob = .046
H_3: Usefulness of a statement of measured units mode of nutrient data presentation.	χ^2 = 20.772 df = 9 prob = .014	H_1: Potassium (D)	χ^2 = 26.867 df = 9 prob = .002
H_1: Calories (D)[1]	χ^2 = 13.545 df = 6 prob = .035	H_1: Protein (D)	χ^2 = 22.694 df = 6 prob = .002
H_1: Cholesterol (C)[2]	χ^2 = 16.996 df = 9 prob = .049	H_1: Saturated Fat (D)	χ^2 = 18.223 df = 6 prob = .006
H_1: Cholesterol (D)	χ^2 = 24.352 df = 9 prob = .049	H_1: Sodium (C)	χ^2 = 24.064 df = 9 prob = .004
H_1: CHO[3] - Fiber (D)	χ^2 = 19.387 df = 62 prob = .004	H_1: Sodium (D)	χ^2 = 24.865 df = 9 prob = .003
H_1: CHO - Starches (D)	χ^2 = 21.803 df = 9 prob = .009	H_1: Vitamin A (D)	χ^2 = 16.665 df = 9 prob = .054
H_1: CHO - Sugars (D)	χ^2 = 20.336 df = 9 prob = .008		

[1](D) = Dietitians

[2](C) = Consumers

[3]CHO = Carbohydrates

Similarily, all the dietitians favored the "statement of measured units" as "very useful" mode of nutrient data presentation most frequently, while 57.7 percent of the "DIBI members" rated it only "of some use." In contrast, only the majority of "DIBI members" felt that the "pie chart" mode of nutrient data presentation ws "very useful." The remaining dietitians however, ranked this presentation mode as "of some use" most frequently.

Regarding the significant nutrients in Table XXX, only "protein information, for dietitians' use, and "sodium" information, for consumers' use, were predominately ranked as "very useful", by all of the practice groups. The "CUP" dietitians classified the remaining nutrients most often as "of some use." The "DIBI dietitians" classified them as "very useful", except information on "vitamin A", and "carbohydrates which are sugars and fiber" (for dietitians' use). These latter nutrients they ranked as "of some use" most often.

The "HCDS group" ranked all of the remaining nutrients, in Table XXX, predominately as "very useful", except for "vitamin A" information (for dietitians' use), which had an even split between "very useful' and "of some use." The "SFS group" had the most diversified rankings of all the PG. These dietitians ranked "carbohydrates which are starches and sugars", "fat", "sodium", and "vitamin A" information (for dietitians' use), and "cholesterol" information (for consumers' use), as "very useful" most often. "Calorie" and "polyunsaturated fat" information, for their use, was predominately ranked "of some use", and "carbohydrate which is fiber", "cholesterol", "potassium", and saturated fat" information (for dietitians' use), was ranked "of little or no use" most frequently, by them.

Profit or Nonprofit Organization. The institutional variable of profit vs. nonprofit organization had a statistical significance on all variates in all hypotheses, except H_4 (Table XXXI). Regardless of the organizations' classification, the largest percentage of dietitians felt they had "a lot of impact" in determining specific brands of various foods to be purchased. The majority of dietitians in "organizations not operating for profit," favored the classification of "very useful" for the statement of measured units" mode of nutrient data presentation. Those dietitians operating in a "profit organization" indicated the largest number classified this mode as only "of some use". Both types of organizations indicated that "education text references" were only "of some use", as a nutrition information format, most often. There was no question as to the marked "yes" preference, for not less than 92.0 percent of the dietitians, of both groups, regarded the question as to whether nutrition labeling should contain information of proper handling and preparation of foods for optimal retention of nutritional quality.

Of the significant nutrients in Table XXXI, only "sodium" information, for consumers' use, was ranked "very useful" most frequently by both organizational types. The "profit organization" dietitians ranked "iron", "calcium", "carbohydrate which is fiber", and "vitamins A and C" information (for consumers' use); "carbohydrates which are sugars and fiber information" (for dietitians' use) "of some use" most frequently. "Iodine" (for consumers' use) "calcium and zinc" information (for dietitians' use) were predominately ranked "of little or no use" by the dietitians in "profit organizations".

Regarding the dietitians in "nonprofit organizations", they ranked "iron" information (for consuemrs's use); "calcium, and carbohydrates

TABLE XXXI

BELIEF, PRACTICE AND ATTITUDE VARIATES BY PROFIT OR NONPROFIT ORGANIZATION

Belief, Practice and Attitude Variates	Profit or Nonprofit Organization	Belief, Practice and Attitude Variates	Profit or Nonprofit Organization
H_2: Impact that dietitians have on determining specific brands of various foods to be purchased.	$\chi^2 = 9.101$ df = 3 prob = .028	H_1: CHO - Sugars (D)	$\chi^2 = 8.240$ df = 3 prob = .041
H_3: Usefulness of a statement of measured units mode of nutrient data presentation.	$\chi^2 = 9.855$ df = 3 prob = .019	H_1: Iodine (C)	$\chi^2 = 8.891$ df = 3 prob = .031
H_3: Usefulness of educational text references.	$\chi^2 = 8.853$ df = 3 prob = .031	H_1: Iron (C)	$\chi^2 = 10.572$ df = 3 prob = .014
H_5: Whether information on proper handling & preparation of foods on labeling would be used as an educational tool for employees.	$\chi^2 = 3.867$ df = 1 prob = .049	H_1: Sodium (C)	$\chi^2 = 10.568$ df = 3 prob = .014
H_1: Calcium (C)[1]	$\chi^2 = 14.873$ df = 3 prob = .002	H_1: Vitamin A (C)	$\chi^2 = 12.007$ df = 3 prob = .007
H_1: Calcium (D)[2]	$\chi^2 = 7.645$ df = 3 prob = .054	H_1: Vitamin C (C)	$\chi^2 = 14.668$ df = 3 prob = .002
H_1: CHO[3] - Fiber (C)	$\chi^2 = 10.923$ df = 3 prob = .012	H_1: Zinc (D)	$\chi^2 = 8.929$ df = 3 prob = .030
H_1: CHO - Fiber (D)	$\chi^2 = 7.144$ df = 2 prob = .028		

[1](C) = Consumers

[2](D) = Dietitians

[3]CHO = Carbohydrates

are sugars and fiber" information (for dietitians' use) as "very useful" most often. "Of some use" was the most frequently assigned ranking to "calcium", "carbohydrate which is fiber", and "vitamin A and C" information (for dietitians' use) were ranked "of little or no use" predominately by the dietitians in "nonprofit organizations".

Largest Form of Government Subsidies

The form in which the SFS group received its largest amount of governmental subsidies only had statistical significance on variates in H_1, H_2, and H_5 (Table XXXII). Interestingly, one of those significant variates involved the dietitians' rating of their impact on amounts of various foods to be purchased--the majority of dietitians, within each form/classification felt they had "a lot of impact" in this area. Regardless of their largest form of subsidies received, the vast majority of these dietitians were in favor of nutrition labeling that contained information on proper handling and preparation of foods for optimal retention of nutritional quality.

The SFS dietitians, who claimed their largest form of governmental subsidies were "commodities", indicated that information on the significant nutrient, "carbohydrates which are starches and sugars" (for consumers' use) were predominately ranked as "very useful". Their usefulness for "calcium" (for dietitians' use) was equally split between those dietitians who considered it "very useful" and those who thought it "of little or no use". "Niacin", "thiamin", and "riboflavin" information (for dietitians' use) were considered mostly to be only "of some use" to these dietitians. The remaining significant nutrients: "cholesterol"; "folacin"; "iodine"; "pantothenic acid"; and "polyunsaturated

TABLE XXXII

BELIEF, PRACTICE AND ATTITUDE VARIATES BY FORM OF LARGEST AMOUNT OF GOVERNMENT SUBSIDIES

Belief, Practice and Attitude Variates	Form of the Largest Amount of Government Subsidies	Belief, Practice and Attitude Variates	Form of the Largest Amount of Government Subsidies
H_2: Impact that dietitians have on determining specific amounts of various foods to be purchased.	$\chi^2 = 13.499$ df = 6 prob = .036	H_1: Iodine (D)	$\chi^2 = 13.365$ df = 6 prob = .038
H_5: Whether nutrition labeling should contain information on proper handling & preparation of foods for optional retention of nutritional quality.	$\chi^2 = 8.365$ df = 2 prob = .015	H_1: Niacin (D)	$\chi^2 = 18.192$ df = 6 prob = .006
		H_1: Pantothentic Acid (D)	$\chi^2 = 15.468$ df = 6 prob = .017
H_1: Calcium (D)[1]	$\chi^2 = 12.974$ df = 6 prob = .043	H_1: Polyunsaturated Fat (D)	$\chi^2 = 12.925$ df = 6 prob = .044
H_1: CHO[2] - Starches (C)[3]	$\chi^2 = 16.654$ df = 6 prob = .011	H_1: Riboflavin (D)	$\chi^2 = 18.192$ df = 6 prob = .006
H_1: CHO - Sugars (C)	$\chi^2 = 16.116$ df = 6 prob = .013	H_1: Thiamin (D)	$\chi^2 = 18.192$ df = 6 prob = .006
H_1: Cholesterol (D)	$\chi^2 = 13.652$ df = 6 prob = .034	H_1: Vitamin E (D)	$\chi^2 = 12.461$ df = 6 prob = .052
H_1: Folacin (D)	$\chi^2 = 12.706$ df = 6 prob = .048	H_1: Vitamin K (D)	$\chi^2 = 12.461$ df = 6 prob = .052

[1](D) = Dietitians

[2]CHO = Carbohydrates

[3](C) = Consumers

fat"; and "vitamins E and K" (for dietitians' use) were all ranked "of little or no use" by the majority of dietitians receiving their largest government subsidies in the form of "comodities". Note that "vitamins E and K" received an equal percentage of dietitians ranking this information "of some use" to them, as those who ranked it "of little or no use".

Those SFS dietitians receiving their largest amount of governmental subsidies in the form of "financial aid, in lieu of commodities", predominately ranked all of the significant nutrients in Table XXXII as "very useful". Note that an equal percentage of them ranked the "vitamins E and K" information only "of some use" to them, as did those that ranked this information as "very useful".

Reimbursable Meal Administered. Of the three types of food programs that could be administered by a school, the reimbursable meal was the only one that had statistical significance on variates associated with HG, H_2, and H_3 only. The "impact" ratings paralleled the above results due to the largest form of governmental subsidies received, but the preferred method of declaring the micronutrients was equally split between "measuring units/serving" and "the present percentage of U.S. RDA/serving". The dietitians indicated most frequently that iron information was "very useful" to them.

Evaluation of Hypothesis Six

This hypothesis was formulated as an analytical tool, to infer the dietitians in management's assumed positive attitude(s) toward nutrition labeling, from any statisticlly significant observed consistency in behavior. The actual H_6 proposed by the researcher was: "There will be no significant relationship between the values assigned to specified

TABLE XXXIII

PRACTICE AND ATTITUDE VARIATES BY REIMBURSABLE MEAL ADMINISTERED

Practice and Attitude Variates	Reimbursable Meal Administered
H_2: Impact that dietitians have on amounts of various foods to be purchased.	$\chi^2 = 14.720$ df = 6 prob = .023
H_3: Preferred method of declaring micronutrients.	$\chi^2 = 11.908$ df = 4 prob = .018
H_1 Iron (D)[1]	$\chi^2 = 13.756$ df = 6 prob = .033

[1](D) = Dietitians

nutrients and those assigned to various diet-related health problems."

The researcher failed to accept this hypothesis, because significant relationships were established between various nutrients, and numerous diet-related health problems, that had been specified and ranked by the dietitians surveyed. Similarly, significant relationships were established between various nutrients, and the proposed questions of whether: the government should allow health or disease-related truthful claims on food labels; consumers should be told, on the food label, of specific substances not in the product (Table XXXIV).

Health Problems Ranked Number One. The top five diet-related health problems, which the dietitians principally ranked as their number one priority, included: "obesity/overweight"; "heart/coronary disease"; "food faddism"; "hypertension"; and "diabetes". No less than 51.4 and 60.0 percent of the dietitians that ranked "obesity/overweight" and "food faddism", respectively, as their number one priority, also thought that all the statistically significant nutrients listed in Table XXXIV were "very useful", or "of some use"--except, "folacin" and "selenium" (for consumers' use), and "magnesium" amd manganese" (for dietitians' use). These latter nutrients were ranked "of little or no use", or "don't know enough" by the majority of dietitians. Nutrients associated with "obesity/overweight", that had received at least 85.0 percent of their rankings in the "very useful", or "of some use" category, were: "protein", "fat" and "sodium" (for consumers' use). Nutrients associated with "food faddism", that had received at least 85.0 percent of their rankings in the "very useful", or "of some use" category, were: "potassium" and "sodium" (for consumers's use), and "iron",

TABLE XXXIV

NUTRIENTS BY DIET-RELATED HEALTH PROBLEMS RANKED #1

Nutrients (H_1)	Diet-Related Health Problems Ranked #1 (H_4)	Nutrients (H_1)	Diet-Related Health Problems Ranked #1 (H_4)	Nutrients (H_1)	Diet-Related Health Problems Ranked #1 (H_4)
Calcium (D)[1]	χ^2 = 70.019 df = 30 prob = .0001	Polyunsaturated Fat (D)	χ^2 = 73.404 df = 27 prob = .0001	Thiamin (D)	χ^2 = 68.721 df = 30 prob = .0001
Cholesterol (C)[2]	χ^2 = 47.325 df = 27 prob = .009	Potassium (C)	χ^2 = 42.641 df = 27 prob = .028	Vitamin A (D)	χ^2 = 66.863 df = 30 prob = .0001
Fat (C)	χ^2 = 57.668 df = 27 prob = .0005	Potassium (D)	χ^2 = 64.473 df = 27 prob = .0001	Vitamin B_6 (D)	χ^2 = 70.046 df = 30 prob = .0001
Folacin (C)	χ^2 = 44.961 df = 30 prob = .039	Protein	χ^2 = 57.211 df = 30 prob =.002	Vitamin B_{12} (D	χ^2 = 72.988 df = 30 prob = .0001
Iron (D)	χ^2 = 69.086 df = 30 prob = .0001	Riboflavin (D)	χ^2 = 70.917 df = 30 prob = .0001	Vitamin C (D)	χ^2 = 62.542 df = 30 prob = .0004
Magnesium (D)	χ^2 = 40.232 df = 27 prob = .049	Selenium (C)	χ^2 = 41.344 df = 27 prob = .038	Vitamin D (D)	χ^2 = 55.021 df = 30 prob = .004
Manganese (D)	χ^2 = 41.913 df = 27 prob = .034	Sodium (C)	χ^2 = 48.942 df = 30 prob = .016	Vitamin E (D)	χ^2 = 50.003 df = 30 prob = .012
Niacin (D)	χ^2 = 69.762 df = 30 prob = .0001	Sodium (D)	χ^2 = 69.508 df = 30 prob = .0001	Vitamin K (D)	χ^2 = 57.056 df = 30 prob = .002
Polyunsaturated Fat (C)	χ^2 = 40.052 df = 27 prob = .051				

[1](D) = Dietitians

[2](C) = Consumers

"polyunsaturated fat", and "sodium" (for dietitians' use).

Of the dietitians that ranked "heart/coronary" as their number one priority, no less than 54.5 percent ranked all of the statistically significant nutrients in Table XXXIV as "very useful", or "of some use"--except "folacin" and "selenium" (for consumers' use), and "magnesium", "manganese", "vitamins E and K" (for dietitans's use). Significant nutrients, associated with "heart/coronary disease", that had received at least 85.0 percent of their rankings in the "very useful", or "of some use" category, were "protein", "sodium", "fat", "cholesterol", and "potassium" (for consumers' use).

Concerning "hypertension" ranked as the number one priority, all of the statistically significant nutrients in Table XXXIV were considered "very useful", or "of some use", by at leat 50.0 percent of the dietitians--except, "folacin" and "selenium" (for consumers' use). Significant nutrients, associated with "hypertension", that had received 100 percent of their rankings in the "very useful", or "of some use" category, were: "cholesterol", "fat", "polyunsaturated fat", "protein", and "sodium" (for consumers' use); "calcium", "iron", "polyunsaturated fat", and "sodium" (for dietitians' use).

The dietitians that ranked "diabetes" as their number one priority indicated, by at least 60.0 percent, that all of the statistically significant nutrients in Table XXXIV were "very useful", or "of some use"--except, "folacin" and "selenium" (for consumers' use), and "vitamins E and K" (for dietitians' use). Significant nutrients associated with "diabetes" that had received 100 percent of their rankings in the "very useful", or "of some use" category were "fat", "potassium", and "sodium" (for consumers' use).

Health Problems Ranked Number Two. The top five diet-related health problems, which the dietitians principally ranked as their number two priority, included: "obesity/overweight", "heart/coronary disease", "hypertension", "excess sodium consumption", and "diabetes." The statistically significant (Probability = .0001 and .004) nutrients associated with these health problems were "calorie" and "protein", respectively (both for consumers' use). The nutrients received at least 93.3 percent of the dietitians' ranking of "very useful", or "of some use", in their relationship to all of the health problems previously stated.

Health Problems Ranked Number Three. There existed only one statistically significant (Probability = .0001) nutrient, "calorie" (for consumers' use), that related to the top five diet-related health problems, as ranked by the majority of dietitians surveyed, for their third priority. "Obesity/overweight", "heart/coronary disease", "generally poor/unbalanced diets", "hypertension", and "diabetes" all indicated that 100 percent of their associated rankings, with "calorie" information (for consumers' use), were in the "very useful", or "of some use" category.

Health Problems Ranked Number Four. The dietitians principally ranked the following diet-related health problems as their fourth priority: "generally poor/unbalanced diets", "food faddism", "hypertension", "diabetes", and "cancer". Of the statistically significant nutrients listed in Table XXXV, only "magnesium" (for dietitians' use) received a majority ranking as "very useful", or "of some use", as associated with "generally poor/unbalanced diets". Concerning "food faddism", the

TABLE XXV

NUTRIENTS BY DIET-RELATED HEALTH PROBLEMS
RANKED #4 AND #5

Nutrients (H_1)	Diet-Related Health Problems Ranked #4 (H_4)	Ranked #5 (H_4)
Chromium (C)[1]	χ^2 = 69.066 df = 51 prob = .047	
Copper (C)	χ^2 = 70.671 df = 1 prob = .006	χ^2 = 76.772 df = 57 prob = .042
Magnesium (C)		χ^2 = 78.881 df = 57 prob = .029
Magnesium (D)[2]	χ^2 = 68.178 df = 51 prob = .054	
Manganese (C)	χ^2 = 75.460 df = 51 prob = .015	χ^2 = 77.374 df = 57 prob = .038
Molybdenum (C)	χ^2 = 74.307 df = 51 prob = .018	χ^2 = 79.895 df = 57 prob = .024
Selenium (C)	χ^2 = 72.977 df = 51 prob = .023	
Vitamin B_6 (C)	χ^2 = 75.777 df = 54 prob = .027	
Vitamin B_{12} (C)	χ^2 = 72.684 df = 54 prob = .046	
Vitamin K (C)	χ^2 = 81.817 df = 54 prob = .009	
Zinc (D)	χ^2 = 69.415 df = 51 prob = .044	

[1](C) = Consumers

[2](D) = Dietitians

following statistically significant nutrients received their principal ranking as "very useful", or "of some use", by the dietitians: "magnesium" and "zinc" (for dietitians' use); "vitamins B_6, B_{12}, and K" (for consumers' use). All of the statistically significant nutrients, related to the diet-related health problem "hypertension", only received 44.4 percent of their rankings as "very useful", or "of some use". "Vitamins B_6 and B_{12}" (for consumers' use) were the only statistically significant nutrients that the majority of dietitians ranked as "very useful", or "of some use", as associated with "diabetes". The dietitians, who chose "cancer" as their fourth priority diet-related health problem, predominately ranked the following statistically significant nutrients as "very useful", or "of some use": "magnesium" and "zinc" (for dietitians' use); "manganese" and "vitamins B_6, B_{12}, and K" (for consumers' use).

Health Problems Ranked Number Five. "Generally poor/unbalanced diets" and "diabetes" were the top two diet-related health problems, as indicated by the dietitians' classification(s) for their fifth priority. Of the statistically significant nutrients listed in Table XXXV, that were associated with these two health problems, all were ranked as "of little or no use", or "don't know enough" most frequently.

Questions Concerning Food Labeling Claims. Regarding the question of whether the government should allow health or disease-related truthful claims on the food label, the only statistically significant nutrients, in Table XXVI, that received a majority of the dietitians' rank as "very useful", or "of some use" were: "carbohydrates" and "sodium" (for dietitians' use); "carbohydrates which are starches and sugars" and

TABLE XXXVI

NUTRIENTS BY WHETHER THE GOVERNMENT SHOULD ALLOW HEALTH OR DISEASE-RELATED CLAIMS ON FOOD LABELS

Nutrients (H_1)	Should the Government Allow Health or Disease-Related Truthful Claims on Food Labels? (H_4)	Nutrients (H_1)	Should the Government Allow Health or Disease-Related Truthful Claims on Food Labels? (H_4)
Biotin (C)[1]	χ^2 = 10.914 df = 3 prob = .012	Inositol (C)	χ^2 = 9.289 df = 3 prob = .026
Carbohydrates (D)[2]	χ^2 = 8.183 df = 2 prob = .017	Manganese (C)	χ^2 = 10.147 df = 3 prob = .017
CHO[3] - Starches (C)	χ^2 = 7.873 df = 3 prob = .049	Molybdenum (C)	χ^2 = 10.378 df = 3 prob = .016
CHO - Sugars (C)	χ^2 = 9.077 df = 3 prob = .028	Molybdenum (D)	χ^2 = 10.812 df = 3 prob = .013
Choline/Lecithin (C)	χ^2 = 8.471 df = 3 prob = .037	Phosphorous (C)	χ^2 = 7.839 df = 3 prob = .049
Chromium (C)	χ^2 = 10.842 df = 3 prob = .013	Selenium (C)	χ^2 = 9.582 df = 3 prob = .023
Copper (C)	χ^2 = 9.503 df = 3 prob = .023	Sodium (C)	χ^2 = 8.196 df = 3 prob = .042
Folacin (C)	χ^2 = 13.496 df = 3 prob = .004	Sodium (D)	χ^2 = 8.007 df = 3 prob = .046
		Zinc (C)	χ^2 = 10.438 df = 3 prob = .015

[1](C) = Consumers

[2](D) = Dietitians

[3]CHO = Carbohydrates

"sodium" (for consumers' use). At least 57.0 percent of the dietitians surveyed were in favor of the proposed question, as associated with the previously mentioned nutrients.

The only statistically significant (probablility = .008) nutrient, associated with the question of whether food labels should contain information about specific substances not in the product, was "carbohydrates which are sugars" (for consumers's use). This nutrient was ranked as "very useful", or "of some use", by 66.3 percent of the dietitians surveyed, and 56.6 percent of them were also in favor of the previously stated question.

Evaluation of Hypothesis Seven

This hypothesis was postulated by the researcher, who hoped it would infer the degree of intention(s), that dietitians in management actually maintain, toward implementation of nutrition labeling information into their professional meal planning and procuring. H_7, was stated by the researcher as follows: There will be no significant relationship in the actual utilization of nutrition labeling information by dietitians in management and their perceived goals for nutrition labeing.

The researcher failed to accept this hypothesis, because a statistically significant (probability = .029) relationship was found between: the question of whether the dietitians surveyed would, or would not, use labeling information, on proper handling and preparation of foods for optimal retention of nutritional quality, as an educational tool for their production employees; and "other" specified times, that the dietitians surveyed considered nutrient content/information of food(s)

the most, in their menu planning process (H_5). The "other" specified times included: "selling food(s) to students (consumers)", "teaching food purchasing", "considering special diets", and "teaching special diets". One hundred percent of the dietitians that specified "other" times which received a priority ranking of one or two, said they would use the labeling information as an educational tool for their production employees.

The researcher wanted to verify the statistical significance of this hypothesis further. Thus, she chose to test the one pivotal question in H_2, that contained the analysis of dietitians' perceived usefulness of: "color", "count", "cost", "drained weigh", "nutritional qualities", and "other" information in actual practice with food bid specifications, with all of the researcher's proposed belief, attitude, and practice variables. The researcher believed that such an analysis would produce a good cross-check, on the dietitians' motivation to comply their actual behavior (practice), with their inferred practices, attitudes, and beliefs.

"Color" Information. No less than 50.0 percent of all the dietitians surveyed, ranked "color" information as "very useful", when associated with the percentages of the statistically significant variables in Table XXXVII, that were classified in "very useful", or "of some use" (or: number one, or number two priority; "a lot of impact", or "some impact") categories.

"Count" Information. Of all the dietitians surveyed, that ranked "count" information as "very useful", no less than 52.4 percent

TABLE XXXVII

PRACTICE AND ATTITUDE VARIATES BY USEFULNESS OF "COLOR" INFORMATION IN FOOD BID SPECIFICATIONS

Practice and Attitude Variates	Usefulness of "Color" Information in Food Bid Specifications
H_2: Nutrient content/information of food(s) considered the most when actually making purchasing decisions.	$\chi^2 = 12.327$ df = 6 prob = .055
H_3: Usefulness of educational text references formats.	$\chi^2 = 25.482$ df = 9 prob = .0025
H_2: Impact that dietitians have on developing food bid specifications.	$\chi^2 = 24.085$ df = 9 prob = .004
H_1: Calcium (C)[1]	$\chi^2 = 20.194$ df = 9 prob = .017
H_1: CHO[2]-Fiber (C)	$\chi^2 = 16.845$ df = 9 prob = .051
H_1: CHO-Fiber (D)[3]	$\chi^2 = 14.235$ df = 6 prob = .027
H_1: Fat (D)	$\chi^2 = 55.673$ df = 9 prob = .0001
H_1: Folacin (D)	$\chi^2 = 18.008$ df = 9 prob = .035
H_1: Iodine (D)	$\chi^2 = 18.948$ df = 9 prob = .026
H_1: Manganese (D)	$\chi^2 = 16.864$ df = 9 prob = .051
H_1: Phosphorous (D)	$\chi^2 = 20.715$ df = 9 prob = .014

[1](C) = Consumers

[2]CHO = Carbohydrates

[3](D) = Dietitians

indicated that the statistically significant variables in Table XXXVIII were classified in the "very useful", or "of some use" (or number one, or number two priority; "a lot of impact", or "some impact") categories.

"Cost" Information. "Very useful" was the assigned rank, given by the dietitians, to 49.2 percent of the "cost" information, as associated with the top two time rankings during the menu planning process, that "when actually making purchasing decisions" was indicated as the most important time for the dietitians to consider nutrient content/ information of food(s). The percentage of "cost" information, that was ranked "very useful" by all the dietitians surveyed, in relation to the two most preferred methods of declaring micronutrients ("measuring units/servings" and "present percentage of U.S. RDA serving") were 47.6 and 40.8, respectively. In additon, 96.0 percent of the dietitians, who ranked "cost" information in the "very useful", or "of some use" category, were in favor of nutrition information that focused on aiding consumers in making product comparisons. No less than 80.0 percent of the dietitians, that ranked "cost" information as "very useful", indicated that they also had "a lot of impact", or "some impact", in "developing food bid specifications", and determining amounts of various foods to be purchased." The percentage of statistically significant nutrients in Table XXXIX, that were classified in the "very useful", or "of some use" category and related to "cost" information ranked "very useful", were: 85.4, 45.7, and 90.8; for "fat", "folacin", and "protein" (for dietitians' use), respectively.

"Drained Weight" Information. Less than half of the dietitians, that ranked "drained weight" information as "very useful", also ranked

TABLE XXXVIII

PRACTICE AND ATTITUDE VARIATES BY USEFULNESS OF "COUNT" INFORMATION IN FOOD BID SPECIFICATIONS

Practice and Attitude Variates	Usefulness of "Count" Information in Food Bid Specifications
H_2: Nutrient content information of food(s) considered the most when making purchasing decisions.	χ^2 = 71.014 df = 6 prob = .0001
H_3: Usefulness of the pie chart mode of nutrient data presentation.[1]	χ^2 = 16.544 df = 9 prob = .056
H_3: Usefulness of the bar graph mode of nutrient data presentation.	χ^2 = 21.377 df = 9 prob = .011
H_2: Impact that dietitians have on developing food bid specifications.	χ^2 = 26.783 df = 9 prob = .0002
H_2: Impact that dietitians have on determining amounts of various foods to be purchased.	χ^2 = 32.694 df = 9 prob = .0002
H_1: Calcium (C)[2]	χ^2 = 17.391 df = 9 prob = .043
H_1: Fat (D)[3]	χ^2 = 64.015 df = 9 prob = .0001
H_1: Protein (C)	χ^2 = 18.089 df = 9 prob = .034

[1]Included because a pertinent, closely significant datum.

[2](C) = Consumers

[3](D) = Dietitians

TABLE XXXIX

BELIEF, PRACTICE AND ATTITUDE VARIATES BY USEFULNESS OF "COST" INFORMATION IN FOOD BID SPECIFICATIONS

Belief, Practice and Attitude Variates	Usefulness of "Cost" Information in Food Bid Specifications
H_2: Nutrient content information of food(s) considered the most when making purchasing decisions.	χ^2 = 72.163 df = 6 prob = .0001
H_3: Preferred method of declaring micronutrients.	χ^2 = 41.608 df = 15 prob = .0003
H_5: Whether nutrition information should be focused on aiding consumers in making product comparisons.[1]	χ^2 = 8.466 df = 3 prob = .037
H_2: Impact that dietitians have on developing food bid specifications.	χ^2 = 25.054 df = 9 prob = .003
H_2: Impact that dietitians have on determining amounts of various foods to be purchased.	χ^2 = 19.862 df = 9 prob = .019
H_1: Fat (D)[2]	χ^2 = 63.092 df = 9 prob = .0001
H_1: Folacin (D)	χ^2 = 17.279 df = 9 prob = .045
H_1: Protein (D)	χ^2 = 13.606 df = 6 prob = .034

[1]A significant result of H_7.

[2](D) = Dietitians

"when actually making purchasing decisions" as one of the top two times in their menu planning process, that they consider nutrient content/ information the most. Of the dietitians that ranked the "drained weight" information as "very useful", 76.2 percent indicated they considered the "USDA Dietary Guidelines (or other food guides)" in the "very useful", or "of some use" category, as a nutrition information format. Additionally, 79.3 and 85.1 percent of these dietitians, that ranked "drained weight" information as "very useful", indicatd that they had "a lot of impact", or "some impact" in: "developing food bid specifications"; "determining amounts of various foods to be purchased", respectively. The only statistically significant nutrient in Table XL that wasn't ranked in the "very useful", or "of some use" category, by at least 69.0 percent--as associated with the number of dietitians who ranked "drained weight" information as "very useful"--was "folacin" (for dietitians' use).

"Nutritional Qualities" Information. When the number of dietitians, that ranked "nutritonal qualities" information as "very useful", is associated with the statistically significant formats of nutrition information in Table XLI "USDA Handbook #8 (or current revised editions)", "reference books made available by the food manufacturer(s)", and "educational reference texts" that were ranked in the "very useful", or "of some use" category, the following percentages resulted: 94.0, 88.1, and 80.3, respectively. Of those dietitians that ranked "nutritional qualities" information as "very useful": 98.2 percent said they would use labeling information of proper handling and preparation of food(s) as an educational tool for their production employees; 85.1 percent indicated they had "a lot of impact", or "some impact" in

TABLE XL

PRACTICE AND ATTITUDE VARIATES BY USEFULNESS OF "DRAINED WEIGHT" INFORMATION IN FOOD BID SPECIFICATIONS

Practice and Attitude Variates		Usefulness of "Drained Weight" Information in Food Bid Specifications
H_2:	Nutrient content information of food(s) considered the most when making purchasing decisions.	χ^2 = 54.380 df = 6 prob = .0001
H_3:	Usefulness of the USDA Dietary Guideline (or other food guides) format.	χ^2 = 15.777 df = 6 prob = .015
H_2:	Impact that dietitians have on developing food bid specifications.	χ^2 = 17.215 df = 9 prob = .046
H_2:	Impact that dietitians have on determining amounts of various foods to be purchased.	χ^2 = 18.331 df = 9 prob = .032
H_1:	CHO[1] - Starches (D)[2]	χ^2 = 30.131 df = 9 prob = .0004
H_1:	Fat (D)	χ^2 = 63.152 df = 9 prob = .0001
H_1:	Folacin (D)	χ^2 = 20.778 df = 9 prob = .014

[1]CHO = Carbohydrates

[2](D) = Dietitians

TABLE XLI

BELIEF, PRACTICE AND ATTITUDE VARIATES BY USEFULNESS OF "NUTRITIONAL QUALITY" INFORMATION IN FOOD BID SPECIFICATIONS

	Belief, Practice and Attitude Variates	Usefulness of Nutritional "Quality" Information in Food Bid Specifications
H_3:	Usefulness of the USDA Handbook #8 (or current revised editions.	χ^2 = 20.030 df = 9 prob = .018
H_3:	Usefulness of food manufacturer(s)' reference book formats.	χ^2 = 16.994 df = 9 prob = .049
H_3:	Usefulness of educational text references' formats	χ^2 = 16.836 df = 9 prob = .051
H_5:	Whether information on proper handling & preparation of foods on labeling would be used as an educational tool for employees.[1]	χ^2 = 7.433 df = 3 prob = .059
H_2:	Impact that dietitians have on determining specific brands of various foods to be purchased.[2]	χ^2 = 16.502 df = 9 prob = .057
H_1:	Calories (D)[3]	χ^2 = 13.402 df = 6 prob = .037
H_1:	CHO[4] - Fiber (D)	χ^2 = 19.826 df = 6 prob = .003
H_1:	Cholesterol (D)	χ^2 = 19.748 df = 9 prob = .019
H_1:	Fat (D)	χ^2 = 64.146 df = 9 prob = .0001
H_1:	Folacin (D)	χ^2 = 20.197 df = 9 prob = .017
H_1:	Protein (D)	χ^2 = 17.563 df = 6 prob = .0074
H_1:	Saturated Fat (D)	χ^2 = 15.010 df = 6 prob = .020
H_1:	Vitamin A (D)	χ^2 = 22.725 df = 9 prob = .007
H_1:	Vitamin K (D)	χ^2 = 17.448 df = 9 prob = .042
H_1:	Zinc (D)	χ^2 = 17.952 df = 9 prob = .036

[1] Included because a closely significant result of H_7.

[2] Included because of pertinent, closely significant datum.

[3] (D) = Dietitians

[4] CHO = Carbohydrates

"determining amounts of various foods to be purchased; no less than 50.0 percent of them ranked all of the statistically significant nutrients in Table XLI, in the "very useful", or "of some use" category--except "zinc" (for dietitians' use), which received only 45.3 percent.

"Other" Food Bid Specification Information. Specified "other" types of information, useful to dietitians in food bid specifications, included : "ingredients", "flavor", "brand name", "growing origin or area", "grades", and "meat/meat alternate combinations". The majority of dietitians, that specified these "other" types of information, were in favor of food labeling that told consumers of specific substances not in the product. One hundred percent of those who indicated "brand name", thought all of the statistically significant nutrients in Table XLII were "very useful", or "of some use". One hundred percent of those who indicated "growing origin or area", thought all of the statistically significant nutrients were "very useful", or "of some use", except "copper" (for dietitians' use). A majority of those, who specified "grades", thought only "vitamins B_6 and B_{12}" (for dietitians' use) were "very useful", or "of some use".

Comparison of Studies

In 1971 Grant called upon dietitians, as a vital source of leadership to guide government and industry, for their cooperation and input into the development of sound nutrition labeling. Since that time, there have been only two surveys conducted, that have utilized nutrition professionals as subjects (Call and Hayes, 1970; Heimbach and Stokes, 1981). (Hereafter these surveys will be referred to as the 1970 survey and 1981 survey, respectively.) With the permission of Stokes (1981), the

TABLE XLII

ATTITUDE VARIATES BY USEFULNESS OF "OTHER" INFORMATION IN FOOD BID SPECIFICATIONS

Attitude Variates	Usefulness of "Other" Information in Food Bid Specifications
H_4: Should food labels contain information about specific substances <u>not</u> in the product?	$\chi^2 = 11.000$ df = 5 prob = .051
H_1: Copper (D)[2]	$\chi^2 = 11.000$ df = 5 prob = .051
H_1: Folacin (D)	$\chi^2 = 20.197$ df = 9 prob = .017
H_1: Magnesium (D)	$\chi^2 = 11.000$ df = 5 prob = .051
H_1: Phosphorous (D)	$\chi^2 = 18.508$ df = 10 prob = .047
H_1: Vitamin B_6 (D)	$\chi^2 = 18.944$ df = 10 prob = .041
H_1: Vitamin B_{12} (D)	$\chi^2 = 18.944$ df = 10 prob = .041

[1]Includes: ingredients; flavor; brand name; growing origin or area; grades; meat/meat alternate combinations.

[2](D) = Dietitians

researcher utilized many questions from the 1981 survey in her own survey. The questions in the 1981 survey were taken directly from the FDA 1978 Consumer Food Labeling Survey (Heimbach and Stokes, 1979), and paralleled many of those in the 1970 survey. (Hereafter the FDA 1978 Consumer Food Labeling Survey will be referred to as the 1978 survey.) Consequently, the FDA compared the congruent results of the 1970, 1978, and 1981 surveys, in the preliminary summary report of their 1981 survey (Heimbach and Stokes, 1981). The researcher purported that the affect(s) of varying degrees of nutrition knowledge, on nutrition labeling attitudes and practices, could be evaluated through the comparisons of her results, and those of the previously stated studies. It was hoped that the recommendation for more standardizaton of instruments, across studies, would also be fulfilled. (See pp. 66-67 in Chapter III.)

Nutrient Information

Table XLIII shows the dietitians in management's rankings of nutrients. (See p. 70 in Chapter III for an explanation of the scoring method.) In Call and Hayes' 1970 survey:

> . . . they presented a similar but shorter list (which did not include types of carbohydrates or the less familiar vitamins and minerals), asking respondents to set each nutrient's priority fo rlabel space as 'high', 'medium', or 'low' (Heimbach and Stokes, 1981, p. 5).

Although this scale was not identical to that used in the 1978 and 1981 surveys, and the researcher's survey, Heimbach and Stokes (1981, p. 5) had determined that ". . . it is sufficiently similar that calculation of rating scores (using 'high priority' = 100, 'medium priority' = 50, and 'low priority' = 0) for comparison purposes has some legitimacy."

TABLE XLIII

ADA DIETITIANS IN MANAGEMENTS'S RATINGS OF UTILITY[1] TO CONSUMERS AND THEMSELVES OF NUTRITION INFORMATION

Nutrients	Total Sample		CUF		DIBI		HCDS		SFS	
	C[2] %	D[3]	C[2] %	D[3]	C[2] %	D[3]	C[2] %	D[3]	C[2] %	D[3]
Calories	89.7	64.2	84.4	53.6	90.7	71.4	92.0	85.4	94.8	55.8
Sodium (Salt)	77.7	69.0	62.2	54.8	92.6	80.9	86.0	91.7	86.2	61.5
Protein	71.0	78.8	64.4	66.7	75.9	78.6	74.0	95.8	74.1	82.7
Fat	73.2	65.1	64.4	58.5	83.3	76.2	74.0	81.3	76.8	53.3
Iron	67.1	65.0	60.0	51.2	68.5	73.8	64.0	81.3	79.3	65.4
Carbohydrates	69.4	67.3	63.3	59.5	77.8	69.0	76.0	85.4	65.5	61.5
Calcium	58.1	57.1	52.3	44.1	65.4	64.3	52.0	75.0	65.5	55.8
Cholesterol	61.2	53.6	48.9	45.2	75.9	60.0	68.0	81.3	60.7	36.0
% Polyunsaturated Fat	60.1	57.1	46.7	45.0	68.5	76.5	68.8	77.1	66.1	44.0
% Saturated Fat	60.1	55.5	48.9	47.6	68.5	62.5	64.0	77.1	66.1	42.0
Amount of CHO which is sugars	50.0	53.1	40.0	38.1	61.1	52.5	46.0	77.1	58.9	55.8
Vitamin C	53.6	55.9	53.3	45.1	55.6	55.0	50.0	68.8	55.2	61.5
Potassium	54.8	54.5	48.9	39.3	70.4	64.3	56.0	86.9	48.2	42.0
Amount of CHO which is fiber	52.0	51.8	47.7	46.4	59.6	47.5	52.0	77.1	51.8	40.0
Vitamin A	46.0	52.7	42.2	36.6	46.3	61.8	42.0	68.8	55.2	63.5
Vitamin D	40.2	45.9	40.0	31.7	38.9	50.0	36.0	64.6	48.3	48.1
Riboflavin	42.5	45.5	37.8	32.9	42.6	45.0	38.0	62.5	53.4	50.0
Thiamin	42.5	45.0	37.8	32.9	44.4	50.0	38.0	62.5	51.7	48.1
Niacin	42.9	45.0	37.8	32.9	44.4	42.5	38.0	62.5	53.4	50.0
Amount of CHO which is starches	45.1	52.2	37.5	39.3	50.0	55.0	47.9	77.1	50.0	48.1
Vitamin B_6	34.1	40.0	32.2	26.3	35.2	42.5	32.0	60.4	37.9	40.4
Vitamin B_{12}	35.7	39.5	33.3	28.8	37.0	40.0	32.0	54.2	41.4	42.3
Iodine	28.8	36.1	27.8	30.9	25.9	41.2	28.0	40.9	33.9	45.5
Vitamin E	31.6	32.9	32.2	21.9	29.6	37.5	26.0	32.8	37.5	34.6
Phosphorous	16.4	26.6	15.6	17.9	16.7	27.5	14.0	39.6	19.6	28.0
Folacin	20.3	27.9	17.4	20.7	21.2	27.5	20.0	36.4	24.1	32.7
Zinc	17.6	25.2	18.9	19.1	16.7	22.5	16.0	37.5	17.9	26.0
Magnesium	19.6	30.9	20.0	21.4	18.5	25.0	16.0	50.0	23.2	34.0
Vitamin K	29.4	33.0	27.8	21.4	27.8	35.0	26.0	50.0	36.2	34.6
Panthothenic acid	20.6	27.5	18.9	19.0	21.2	32.5	18.0	36.4	26.8	30.0
Copper	13.6	22.3	15.6	16.7	11.1	20.0	14.0	30.4	12.5	26.0
Manganese	15.3	24.5	15.6	17.9	16.7	22.5	10.4	35.7	17.9	28.0
Biotin	17.3	24.3	16.7	19.0	17.3	22.5	18.0	34.1	19.6	26.0
Selemium	12.5	19.1	14.8	14.3	11.1	17.5	10.0	23.9	12.5	24.0
Choline/Lecithin	18.2	23.6	19.8	20.7	22.0	22.5	16.0	25.0	14.3	28.0
Chromium	12.9	22.3	14.4	15.5	11.5	17.5	12.0	32.6	12.5	28.0
Inositol	14.4	21.8	15.6	16.7	12.9	17.5	10.0	28.3	17.9	28.0
Molybdenum	16.3	21.1	14.8	16.7	15.4	17.5	12.0	25.0	23.2	28.0
Mean Rating Score	40.3	42.9								
Mean N=118										

[1]Rating score based on the following weighting: 100 = "very useful," 50 = "of some use," 0 = "of little use or "do not know enough".

[2]C = Consumers

[3]D = Dietitians

When the mean scores of the 1970 and 1981 surveys are compared to this survey's [52.5, 53.0 and 40.3 (for consumers' use), and 42.9 (for dietitians' use), respectively], and the standard deviations are compared [16.25, 18.23, 21.58 (for consumers' use), and 15.92 (for dietitians' use), respectively], one can see that they differ very little and affords comparison of scores "without undue violence to the data" (Heimbach and Stokes, 1981, p. 5). Refer to Appendix E, Table LVI for Heimbach and Stokes comparison (1981).

Table XLIV shows a comparison of the top ten ranked nutrients: in this study (total sample for consumers' and dietitians' use); in the 1981 study (total sample and for AIN members); in the 1978 study (total sample of consumers). Table XLV shows the correlations of nutrient information studied in this survey, to that studied in the 1970, 1978, and 1981 surveys.

Diet-Related Health Problems

Table XLVI shows the overall percent rankings of the top five diet-related health problems, as indicatd by the dietitians in management surveyed. This information is further illustrated in Table XLVII, where only the diet-related health problems that received the highest percent rankings, within each DPG, are shown. Some of the rankings contain more than one diet-related health problem, these health problems had received an equal ranking.

Table XLVIII displays the comparison between the most important diet-related health problems in this country, as specified and ranked in the 1981 survey, and the dietitians in management. Table XLVIX further illustrates this comparison, where only the diet-related health problems

TABLE XLIV

COMPARISON OF THE TOP TEN RANKED NUTRIENTS

Total Sample		1981 Survey[2]		1978 Survey[3]
Nutrients for Consumers' Use	Nutrients for Dietitians' Use	Total Sample	AIN Members	Total Sample
1. Calorie	1. Protein	1. Calories	1. Calories	1. Calories
2. Sodium	2. Sodium	2. Fat	2. Fat	2. Protein
3. Fat	3. Carbohydrates	3. Protein	3. Sodium	3. Vitamin C
4. Protein	4. Fat	4. Sodium	4. Protein	4. Fat
5. Carbohydrates	5. Iron	5. Carbohydrates	5. Iron	5. Sugars
6. Iron	6. Calories	6. Iron	6. Carbohydrates	6. Cholesterol[1]
7. Cholesterol	7. Calcium/Polyunsaturated Fat[1]	7. Cholesterol	7. Calcium	7. Iron/Sodium[1]
8. Polyunsaturated Fat/ Saturated Fat[1]	8. Vitamin C	8. Calcium	8. Cholesterol	8. Carbohydrates
9. Calcium	9. Saturated Fat	9. Sugars	9. Fiber	9. Starches
10. Potassium	10. Potassium	10. Fiber	10. Sugars	10. Polyunsaturated Fat

[1]Tie rank of nutrients.

[2]Heimbach and Stokes, 1981.

[3]Heimbach and Stokes, 1979.

TABLE XLV

CORRELATIONS OF NUTRIENT INFORMATION STUDIED

	CUF Members	DIBI Members	HCDS Members	SFS Members	FDA 1981 Survey[2]	FDA 1978 Survey[3]	AIN Members 1970[4]
CUF Members	[1]	.945	.970	.965	.977	.997	*.738*
DIBI Members		[1] .*914*	.957	*1.050*	*.986*	*.884*	
			.988	.959	.961	.893	*.622*
HCDS Members			[1] .*989*	*1.040*	*.964*	*.839*	
				.960	.962	.889	*.615*
SFS Members				[1] *1.040*	*.965*	*.841*	
					.969	.899	*.740*
FDA 1981 Survey[2]					[1] *1.030*	*1.040*	
						.906	*.759*
FDA 1978 Survey[3]						[1] *.804*	
							[1] *.656*
AIN Members 1970[4]							

[1]Numbers in plain type are correlations of the 38 nutrients investigated in the 1978, 1981 FDA studies, as well as this study. Numbers in italics are those 22 nutrients correlated from the 1970 AIN study only.

[2]Heimback and Stokes, 1981.

[3]Heimback and Stokes, 1979.

[4]Call and Hayes, 1970.

TABLE XLVI

OVERALL RANKINGS OF THE TOP FIVE DIET-RELATED HEALTH PROBLEMS

Diet-Related Health Problems	% C[1]	% D[2]	% H[3]	% S[4]	% C	% D	% H	% S	% C	% D	% H	% S	% C	% D	% H	% S	% C	% D	% H	% S
Obesity/Overweight	75	68	58	77	8	18	21	4	3	7	9	9	4	--	12	--	15	--	--	9
Heart/Coronary disease	2.5	14	25	10	31	14	29	29	8	15	18	9	11.5	--	--	10	5	--	--	--
Hypertension	2.5	3.6	8	--	10	32	17	29	14	11	23	13	15	5	6	15	5	15	--	--
Diabetes	5	3.6	4	3	18	21	29	11	33	26	32	26	15	11	12	35	10	15	11	--
Generally poor/unbalanced diets	--	--	--	3	2.5	--	--	7	14	--	4.5	--	11.5	16	12	10	25	8	11	18
Cancer	--	--	--	--	--	--	--	--	3	4	--	13	--	11	17	5	5	--	11	9
Iron deficiency	--	--	--	--	--	--	--	4	--	7	--	13	--	11	6	5	--	23	--	--
Atherosclerosis/ Arteriosclerosis	--	3.6	4	--	2.5	4	--	--	--	7	--	--	8	--	6	5	5	--	--	18
Insufficient fiber consumption	--	7	--	--	--	--	--	--	--	--	--	--	4	5	--	5	--	--	--	9
Malnutrition of pregnant women	--	--	--	--	--	--	--	--	--	4	--	--	--	11	--	--	--	--	--	9
"Other" (gastro-intestinal)	--	--	--	--	--	--	--	--	3	--	4.5	--	4	--	--	5	10	--	33	--
"Other" (renal disease)	--	--	--	--	--	--	--	--	--	4	4.5	--	--	--	17	--	5	8	11	--
Food faddism	10	--	--	3	5	3.6	4	--	--	7	--	--	11.5	11	6	--	5	--	--	--
Excess fat consumption	2.5	--	--	--	5	--	--	4	5.5	4	--	--	4	--	--	--	--	--	--	9
Excess sodium consumption	2.5	--	--	--	8	--	--	7	3	--	--	4	4	--	6	--	--	8	--	--
Malnutrition of infants	--	--	--	3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cardiovascular disease	--	--	--	--	5	4	--	--	--	--	--	4	4	5	--	--	--	--	--	--
Excess sugar consumption	--	--	--	--	5	--	--	--	5.5	--	--	--	4	5	--	--	--	--	--	9
Excess alcohol consumption	--	--	--	--	--	4	--	--	3	--	--	--	--	5	--	--	5	--	11	9
Dental caries	--	--	--	--	--	--	--	7	--	--	--	4	--	--	--	--	--	4	--	--
Malnutrition of the elderly	--	--	--	--	--	--	--	--	--	4	--	--	--	--	--	--	--	4	--	--
Allergies/Intolerances	--	--	--	--	--	--	--	--	3	--	--	4	--	5	--	--	--	--	11	--
Consumption of "additives"/ "chemicals"	--	--	--	--	--	--	--	--	3	--	--	--	--	--	--	--	--	--	--	--
Calcium deficiency	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5	--	8	--	--
"Other" (pancreatitis)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5	--	--	--
"Other" (liver disease)	--	--	--	--	--	--	--	--	--	--	4.5	--	--	--	--	--	--	--	--	--

[1]CUF dietitians

[2]DIBI dietitians

[3]HCDS dietitians

[4]SFS dietitians

TABLE XLVII

TOP FIVE RANKED DIET RELATED HEALTH PROBLEMS

ADA Practice Groups	#1	#2	#3	#4	#5
CUF	Obesity/Overweight	Heart/Coronary Disease	Diabetes	Hypertension and Diabetes	Generally Poor/ Unbalanced Diets
N	30	12	12	4	5
%	75	31	33	15	25
Total N Answering	40	39	36	26	20
DIBI	Obesity/Overweight	Hypertension	Diabetes	Generally Poor/ Unbalanced Diets	Iron Deficiency
N	19	9	7	3	3
%	68	32	26	16	23
Total N Answering	28	28	27	19	13
HCDS	Obesity/Overweight	Heart/Coronary Disease and Generally Poor/ Unbalanced Diets	Diabetes	Cancer and "Other" (Renal Disease)	"Other" (Gastro-intestinal)
N	14	7[1]	7	3	3
%	58	29[1]	32	17	33
Total N Answering	24	24[1]	33	17	9
SFS	Obesity/Overweight	Hypertension and Heart Coronary Disease	Diabetes	Diabetes	Atherosclerosis/ Arteriosclerosis and Generally Poor/ Unbalanced Diets
N	23	8[1]	6	7	2[1]
%	77	29[1]	26	35	18[1]
Total N Answering	30	28[1]	23	20	11[1]

[1]Figures for both health problems.

TABLE XLVIII

THE MOST IMPORTANT DIET-RELATED HEALTH PROBLEMS IN THIS COUNTRY[1]

Health Problem	FDA[2] Total Sample %	AIN Members[2] %	Trade Association Members[2] %	"Interested Consumers"[2] %	Total Sample %
Obesity/Overweight	71	75	66	61	93
Heart/Coronary disease	20	19	22	26	52
Cardiovascular disease	13	15	8	8	5
Atherosclerosis/Arteriosclerosis	7	10	3	2	11
Excess fat consumption	5	4	6	9	7
Excess saturated fat consumption	3	3	5	2	--
Excess cholesterol consumption	3	2	4	4	--
Generally poor/unbalanced diets	21	19	23	28	24
Food faddism	8	9	6	6	15
Malnutrition of the elderly	5	5	2	6	1
Malnutrition of pregnant women	4	5	1	6	3
Malnutrition of infants	3	4	0	3	1
Hypertension	24	23	23	27	47
Excess sodium consumption	9	6	14	17	9
Diabetes	26	28	24	24	66
Cancer	18	19	15	20	12
Dental caries	15	15	18	15	3
Iron deficiency	13	18	7	1	11
Excess sugar consumption	8	5	9	25	6
Excess alcohol consumption	7	9	4	3	5
Calcium deficiency	5	7	2	2	2
Allergies/Intolerances	5	4	6	9	3
Consumption of "additives"/"chemicals"	3	2	3	14	1
Insufficient fiber consumption	3	3	1	4	5
Other:					
renal disease					7
gastro-intestinal					7
pancreatitis					1
liver disease					1
N	815	531	177	107	122

[1] Includes all answers given by 2% or more of respondents.

[2] Heimbach and Stokes, 1981.

TABLE XLIX

COMPARISON OF OVERALL PERCENTAGES FOR THE TOP FIVE DIET-RELATED HEALTH PROBLEMS

FDA 1981	#1	#2	#3	#4	#5
TOTAL SAMPLE[1]	Obesity/Overweight	Diabetes	Hypertension	Generally Poor/ Unbalanced Diets	Heart/Coronary Disease
Percent	71	26	24	21	20
AIN MEMBERS[2]	Obesity/Overweight	Diabetes	Hypertension	Heart/Coronary Disease, Generally Poor/Unbalanced Diets, and Cancer	Iron Deficiency
Percent	75	28	23	19	18
TRADE ASSO-CIATION MEMBERS[3]	Obesity/Overweight	Diabetes	Hypertension and Generally Poor/ Unbalanced Diets	Heart/Coronary Disease	Dental Caries
Percent	66	24	23	22	18
"INTERESTED CONSUMERS"[4]	Obesity/Overweight	Generally Poor/ Unbalanced Diets	Hypertension	Heart/Coronary Disease	Excess Sugar Consumption
Percent	61	28	27	26	25
ADA DIETITIANS IN MANAGEMENT TOTAL SAMPLE	Obesity/Overweight	Diabetes	Heart-Coronary Disease	Hypertension	Generally Poor/ Unbalanced Diets
Percent	93	66	52	47	24

[1,2,3,4]Heimbach and Stokes, 1981.

that received the overall highest percentage rankings are shown.

In answer to the questions of whether the government should allow health or disease-related truthful claims on food labels, the majority of dietitians in management were in favor of this proposition (Table L). This was not the case for the total sample, or AIN members, in 1981 (Appendix E, Table LVII).

Another question, that associated closely to the concept of diet-related health problems, asked whether food labels should be allowed to tell consumers about specific substances not in the product. The overall majority of dietitians in management replied "yes", that belonged to one of the CUF, SFS, or HCDS practice groups. (See p. 92 in Chapter IV for an explanation of specific examples.) The majority of DIBI dietitians replied "no" (Table LI). In contrast, the overall reply to this question was "no" in the 1981 survey (Appendix E, Table LVIII).

Preferred Approaches to Nutrition Labeling

The largest majority of dietitians in management indicated that they thought "information relating to nutrients people sometimes get too much of, like calories, cholesterol, saturated fat, salt, sugar" would be more helpful to consumers than "information relating to nutrients people sometimes get too little of, like protein, vitamins and minerals (Table LII). These responses correlated highly with those of all the 1981 survey's subjects (Appendix E, Table LIX).

The overall majority of dietitians in management preferred the following method of displaying carbohydrate data: "the amount of carbohydrates from sugars and starches each shown separately along with the total amounts of carbohydrates, plus separate declaration of fiber

TABLE L

SHOULD TRUTHFUL HEALTH A DISEASE-RELATED CLAIMS BE PERMITTED ON FOOD LABELS?

	Total Sample %	CUF %	DIBI %	HCDS %	SFS %
No, should not be permitted	41	41	41	46	37
Yes, should be permitted	59	59	59	54	63
N	122	41	27	24	30

TABLE LI

SHOULD LABELS EVER SPECIFY SUBSTANCES NOT IN THE PRODUCTS?

	Total Sample %	CUF %	DIBI %	HCDS %	SFS %
No, they should not	43	37	57	38	41
Yes, this would be useful	57	63	43	62	59
N	124	43	28	24	29

TABLE LII

PREFERRED GENERAL APPROACH TO NUTRITION LABELING

Emphasis	Total Sample %	CUF %	DIBI %	HCDS %	SFS %
Things people get TOO MUCH of	86	77	89	96	90
Things people get TOO LITTLE of	14	23	11	4	10
N	124	43	28	24	29

content" (Table LIII). This trend correlated highly with the total sample, and AIN members' responses, in 1981 (Appendix E, Table LX)).

The large majority of dietitians in management indicated that their preferred method of displaying information about sugars was: "the total amount of sugars from all ingredients--both sugar naturally present in the product and sugars which have been added to the product" (Table LIV). This correlated highly with the overall response of subjects in the 1981 survey (Appendix E, Table LXI).

The two most preferred methods of displaying micronutrients, by the dietitians in management, were "measuring units/serving", and "U.S. RDA per serving" (Table LV). These results show a reversal in the two most preferred methods of all the subjects in the 1981 survey (Appendix E, Table LXII).

In general, the dietitians' suggestions for revising the food label included all of those found in Heimbach and Stokes 1981 survey (Appendix E, Table LXIII).

TABLE LIII

PREFERRED METHOD OF DISPLAYING CARBOHYDRATE DATA

Method	Total Sample %	CUF %	DIBI %	HCDS %	SFS %
Total carbohydrates only	28	31	20	32	26
Total + sugars, starch and fiber	60	57	57	64	67
Other or no preference	12	12	24	4	7
N	116	42	25	22	27

TABLE LIV

PREFERRED METHOD OF DISPLAYING INFORMATION ABOUT SUGARS

Method	Total Sample %	CUF %	DIBI %	HCDS %	SFS %
Total sugars only	68	70	63	68	69
Sugars by type	15	9	11	23	21
Added + natural + total	16	16	26	9	9
Other or no preference	1	5	0	0	0
N	122	44	27	22	29

TABLE LV

PREFERRED METHOD OF DISPLAYING MICRONUTRIENTS

Method	Total Sample %	CUF %	DIBI %	HCDS %	SFS %
U.S. RDA per serving	41	27	64	25	50
U.S. RDA per 100 or 1000 kcal	3	7	0	4	0
Measuring units per serving	48	54	32	63	43
Measuring units per 100 or 1000 kcal	1	2	0	0	0
Measuring units per 100 grams	5	5	0	8	7
Measuring units as a portion of availability	0	0	0	0	0
Other[1]	2	5	4	0	0
Total N	126	44	28	24	30

[1]Includes: "measuring units/serving, plus U.S. RDA statement"; "amount per package unit"; "how item fits into Basic Four--similar to what Kroger and Big Bear are trying to do with recipes an nutrient information."

CHAPTER V

SUMMARY AND RECOMMENDATIONS

The purpose of this study was to assess what nutrition labeling information dietitians in management utilize most effectively, when and where this information is most useful to them, why this information is important to them, and how this information influences their professional practices and attitudes. The probability that a particular relationship existed between their priorities regarding nutrients and diet-related health problems were also analyzed. Finally, through a comparison of this study's results, to those of similar, previous studies (Call and Hayes, 1970; Heimbach and Stokes, 1979, 1981), the researcher hoped to: evaluate the affect(s) of varying degrees of nutrition knowledge, on nutrition labeling attitudes and practices; fulfill the recommendation for more standardization of instruments, across studies in human nutrition behavior. Seven hypotheses were postulated in Chapter I (see pp. 6-7).

The government's concern for human nutrition has been evident since 1894 (Shank, 1980), however consumers' requests for government food regulations did not surface until the early 1900s. Since the first U.S. Federal food laws were passed in 1906, and the Federal Food, Drug and Cosmetic Act was enacted in 1938 with food labeling provisions, many changes in legislation, regulations and jurisdictions have occured.

Wars, economic depressions, and the changing productivity of

agriculture have had major influences on the U.S. public's opinion throughout the years. The public's reaction has always been to support an ever-increasing governmental role in consumer affairs (Egan, 1974). As knowledge about nutrients increased, various standards for nutrients were established for labeling to follow: Minimum Daily Requirements (MDRs) (Lachance, 1973); Recommended Dietary Allowances (RDSs) (NAS, 1980; Staats, 1978b; Shank, 1980); U.S. RDAs (Lachance, 1973; Staats, 1978b; GSA, 1981a). Similarly, numerous guidelines, for the public to use, to interpret nutrient information, have been released over the years (USDA, 1957, 1980; Diet and CHD, 1972; U.S. Senate, 1977, 1978; NAS, NRC, FNB, 1980). The earlier guidelines focused on avoidance of under- or over-consumption, while the more recent guidelines have focused on prevention and control of a variety of chronic diseases (Shank, 1980).

Nevertheless, food labeling remained exceptionally stable until the 1969 White House Conference on Food, Nutrition, and Health (1969 White House Conference, 1970). This conference produced food labeling recommendations that subsequently prompted the FDA to propose new food regulations, in 1971. These regulations were published as final regulations in 1973 (Hutt and Sloan, 1979; Fed. Reg., 1973a). Since then, the USDA, FDA, and FTC have joined forces to improve, streamline, and coordinate the existing food labeling laws and regulations (Fed. Reg., 1980). The agencies were committed to obtaining full public participation in this endeavor, and did so through requests for written comments, various congressional and departmental public hearings, and numerous consumer surveys (Call and Hayes, 1970; Heimbach and Stokes, 1979, 1981; Stokes and Haddock, 1972; U.S. DHEW, 1973-74, 1975, 1979).

Currently the FDA and USDA are working with contracted professional communications experts in the private sector, to design and test alternative labeling formats (Stokes, 1981). Many of the proposed food labeling regulations resulting from the previously mentioned efforts of the USDA, FDA, and FTC have yet to be implemented. The government agencies have continued to work with industry, to evaluate existing food labeling regulations, and continue to seek improvements upon them that answer the needs of the public. Alas, the major existing flaw, with food labeling, remains in the significant void of established, educational programs, that would enable U.S. consumers to fully utilize the nutrition information made available to them, through various labeling efforts (ADA Reaffirms Support, 1979; Congressional Record, 1979; Engstrom, 1980, Fed. Reg., 1979; Hammons, 1978; Heimbach and Stoke, 1979; Society for Nutr. Educ., 1978).

This study utilized a descriptive, mail survey as the instrument to collect data. Many of the survey questions were adapted from previous similar studies (Call and Hayes, 1979; Heimbach and Stokes, 1979, 1981), with the permission of Stokes (1981). The instrument was also distributed to a panel of experts, who examined it for validity. The final survey had two versions; one for the DIBI, HCDS, and CUF practice groups; one for the SFS practice group. The two versions differed only in the questions that were added to the SFS version, to gather data on food programs administered, and government subsidies received by the schools. The surveys were sent to members of the American Dietetic Association, who belonged to the Division of Management Practices, and thus, one of the four dietetic practice groups comprising this division (DIBI, CUF, SFS, HCDS). Subjects were chosen through a method of stratification, by practice group, and a systematic random sampling of each

practice groups' membership mailing labels. See Figure 3 in Chapter III (p. 65).

Chi-square, Pearson's product-moment coefficient of correlation, as well as frequency distribution and percentages, were utilized to test the hypotheses and describe the sample population. Analysis of the data was provided by using the Statistical Analysis System (Barr and Goodnight, 1972). The rating scores used to analyze the nutrient rank data, were the same as those used by Stokes and Heimbach (1979, 1981). A visual presentation, and definitions of variables in the statistical analyses, is illustrated and explained in Figures 1 and 2 (pp. 60, 61).

Demographic Description of Sample

Of the 312 "known", qualified, ADA members invited to participate in this study, 128 (41.0 percent) responded to the questionnaire. The response rate within the practice groups was as follows: CUF, N=45 (57.7 percent); SFS, N=30 (38.0 percent); DIBI, N=28 (37.3 percent); and HCDS, N=25 (31.3 percent).

The dietitians' ages ranged from 22 to over 50, with over 60.0 percent under 40. Over 90.0 pecent of the responding dietitians were female, and they were predominately full-time employees. Years of employment ranged from one to more than 10 years, in their present professional positions. The majority though, had only worked for 1-3 years. The dietitians' number of previously held professional positions, in the area of dietetics, ranged from one to more than five. The highest percentage had only held 1-2 previous professional positions.

All of the dietitians surveyed completed undergraduate education, except one that had an associate degree. Forty-four had complete a master's degree, and two held doctorate degrees. All of the dietitians

were members of the ADA, with 92.2 percent classified as registered dietitians. None of the dietitians surveyed were AIN or ASCN members.

The majority of dietitians surveyed obtained their ADA membership through the internship route. The remaining routes are listed as follows, beginning with the most predominant: master's plus work experience; coordinated undergraduate program: three-year preplanned experience; traineeship; and one person whose route had been "years of experience". When the numbers of dietitians with master's degrees (N= 44) are compared to those that obtained ADA membership via the master's route (N=23), then it is seen that 52.3 percent of those having the master's degree utilized this as a route to ADA membership.

The predominant type of food service system, that the dietitians worked with, was classified as conventional. The highest percentage of these institutions/departments were classified as nonprofit. Within the SFS group, 60.0 percent received "0-24 percent" of their total food inventory government subsidized, with 66.7 percent receiving these subsidies in the form of commodities. The type of feeding program administered most often was the reimbursable meal. Only 8.6 percent of the dietitians indicated that their food service department was contracted to a food management company, and only 9.4 percent indicated that they conducted computerized nutrition analyses of their menus.

Evaluation of the Hypotheses

The researcher failed to accept any of the seven proposed hypotheses, because significant variates were discovered that related to each of the hypotheses, as associated with the selected personal and institutional attributes they were tested against, up to the 0.5 level of significance.

Nutrition Labeling Information Utilized Most Effectively by Dietitians in Management

In the final frequency analyses, the ten (more are listed because of rank ties) nutrients dietitians in management considered most important (for consumers' use) were as follows, in descending priority order: "calories"; "sodium"; "fat"; "protein"; "carbohydrates"; "iron"; "cholesterol"; "polyunsaturated and saturated fat"; "calcium"; and "potassium". The ten (more are listed because of rank ties) nutrients dietitians in management considered most important (for their use) were as follows, in descending priority order: "protein"; "sodium"; "carbohydrates"; "fat"; "iron"; "calories"; "calcium" and "polyunsaturated fat"; "vitamin C"; "saturated fat"; and "potassium". These nutrient rankings were verified, by the numerous statistically significant correlations with various personal and institutional variates, as well as the most important diet-related health problems that were indicated by the dietitians surveyed.

These results differ somewhat, from the nutrient rankings indicated in previous studies (Heimbach and Stokes 1979, 1981), but still confirms the U.S. public's interest with the macronutrients that noramlly appear at the top of nutrition labels (Fed. Reg., 1979). It is interesting to note that consumers most frequently cite the importance of "calorie" information (Heimbach and Stokes, 1981), and this is seen in the dietitians' list of nutrients for consumers' use, but it is ranked much lower for their own use.

"Calorie", "cholesterol", and "saturated fat" were considered "very useful" (for dietitians' use), when the dietitians considered the "nutritional qualities" information in their food bid specifications.

"Protein" information was considered "very useful" (for dietitians' use) when they considered the "cost" and "nutritional qualities" information in their food bid specifications. "Fat" information was considered "very useful" (for dietitians' use), when they considered the "color", "count", "cost", "drained weight", and "nutritional qualities" information in their food bid specifications.

"Count" information was considered "very useful" in food bid specifications by all of the dietitians, regardless of the number of previous professional positions they had held in the area of dietetics. "Nutritional qualities" information was also considered "very useful" in food bid specifications by all the dietitians, who had worked "1-3 years", "7-9", and "10 or more years". The "7-9 years" group ranked it the highest as "very useful". The majority of dietitians, who had only worked "4-6 years" in their present position, thought this information was only "of some use".

The preferred method of displaying carbohydrate information was "the amount of carbohydrates from sugars and starches each shown separately along with the total amount of carbohydrates, plus separate declaration of fiber content". Statistically significant variate correlations to this approach were "undergraduate degree in institution administration" and "SNE member".

The preferred method of displaying information about sugars was "the total amount of sugars from all ingredients - both sugar naturally present in the product and sugars which have been added to the product." The statistically significant variate that correlated with this approach, was a "master's degree in institution administration." The researcher noted that many dietitians indicated on the surveys that they

would actually prefer the approach, "total sugars from all ingredients broken out by type of sugar - e.g., corn syrups, honey, sucrose, lactose, dextrose, etc.", but elected the former approach because of the perceived added costs the latter approach would incur. Heimbach and Stokes (1979) found that the total sugars broken out by type approach was preferred by consumers. The perceived cost of compliance, however, was confirmed by Little, who estimated the first year of compliance alone could range from $23.5 - 83.8 million, depending on the definition of sugar and the trigger point chosen (Food Chem. News, 1981l). The lack of knowledge, and concomitant need for education of consumers were also cited with this approach, by the dietitians.

The three original FDA labeling formats differed only in their expression of the percentage of the RDA [numerical, adjectival, and expressed (pictorally or numerically) as units with ten units equal to 100 percent of the RDA] (Fed. Reg., 1972). In this study the preferred method of declaring the micronutrients (vitamins and minerals) on the label, that statistically correlated with a number of variates, were: "measuring units/serving", "measuring units/100 g", and "present percentage of U.S. RDA/serving." The first and third methods correlated with the variates: "NACUFS member"; "reimbursable meal administered"; and "cost" information, that was ranked as "very useful" in food bid specifications. The first and second methods correlated with the variate, "master's degree in institution administration." The majority of "ASPEN members" correlated with the first method. These results counter Lachance's claim that dietitians and home economists would not find nutrition labeling helpful in menu-planning, because of the difficulty involved in planning a balanced U.S. RDA menu (1973).

The dietitians' overall preferred method of declaring the micronutrients were the "measuring units/serving" and "present percentage of U.S. RDA/serving", in that order of predominance. The overall results from Heimbach and Stokes' 1981 survey indicated the reverse. In a study conducted by the U.S. DHEW, it was discovered that the chief food shoppers, for households in the U.S., thought the label information of least consequence was that on serving size and servings per container (1973-74). Heimbach and Stokes found in their "FDA 1978 Consumer Labeling Survey" that nearly half of the consumer's complaints, about confusion with nutrition-labeled information, was about quantitative terminology - primarily the metric system, but also percentages, and U.S. RDAs. Not until however did the FDA and USDA recognize the importance of establishing uniform serving sizes, for all products within a category of food, to ensure uniform nutrition labeling information (Fed. Reg., 1979).

The dietitians in management surveyed ranked the "pie chart" and "statement of measured units" as the most useful modes of nutrient data presentation. The "pie chart" was considered to be: "very useful", by the majority of dietitians, who had been employed for "7-9 years" (an equal number from this group also ranked this mode "of some use"), and DIBI members; "of some use" by the majority of dietitians, regardless of years of employment, and those who were CUF, HCDS, and SFS members. "Count" information, that was considered "very useful" in food bid specifications, also significantly correlated with this mode of data presentation.

The "statement of measured units" mode of data presentation was considered "very useful" by: the majority of dietitians, regardless of

years of employment (their usefulness ranking became more marked as the number of years employed increased); the majority of dietitians who had held "1-2" or "5 or more previous positions", in the area of dietetics (their usefulness ranking becoming more marked as the number of positions increased); the majority of members belonging to the CUF, SFS, and HCDS practice groups; and the majority of dietitians working in a "nonprofit organization". This mode of data presentation was considered to be only "of some use" to the majority of dietitians who: had held "3-4 previous positions"; were DIBI members; worked in a "profit organization"; and held a "master's" degree in "education or home economics education."

Various alternate formats have been proposed over the years, and have included numerous versions of nutrient density bar graphs (Dickinson and Thompson, 1979; Sorenson and Hansen, 1975), and pie chart formats (Babcock and Murphy, 1973; Dickinson and Thompson, 1979; Brill, 1980; Guthrie, 1980). It has been proven that consumers want clarity, simplification, and logical progression. They also tend to oppose graphs, because they editorialize, and may not reflect their own values and opinions (Hammond, 1978).

This is an area where industry can experiment with dietitians in management. They may vary their nutrition information format, from the stated regulations, when providing this information directly to professionals (e.g., dietitians), accompanied by nutrition information exactly as required by the regulations. Other exceptions to the format regulations are "medical foods", and food products shipped in bulk form, for use solely in the manufacture of other foods (GSA, 1981a).

The usefulness of various nutrition information formats also varied

among the dietitians. The "USDA Handbook #8 (or current revised editions)" was considered to be a "very useful" format, by the majority of dietitians, regardless whether they were employed part or full time. Half of the dietitians, that were "NACUFS members", ranked this format as "of some use". This format also correlated significantly with "nutritional qualities" information, that was ranked "very useful" in food bid specifications. "Reference books made available by the food manufacturer(s)" were ranked "of some use" by the majority of dietitians, regardless of their "RD status", although a higher percentage of the RDs ranked this format as "very useful". This format also correlated with "nutritional qualities" information, that was ranked "very useful" in food bid specifications. "Text reference books used in your educational courses" were ranked as "of some use" by the majority of dietitians, regardless of: "part- or "full-time employment"; their "RD status" (although a higher percentage of the RDs ranked this format as "very useful"); and whether they worked in a "profit" or "nonprofit organization". This format correlated significantly with "color" and "nutritional qualities" information, that was ranked as "very useful" in food bid specifications. The "USDA Dietary Guidelines (or other food guides)" was considered to be a "very useful" format, by the majority of "SNE members", and correlated significantly with "drained weight" information, that was ranked as "very useful" in food bid specifications. "Other" nutrition information formats were listed more often by "RDs", and a higher percentage of those specified were considered "very useful" by them. The "other" formats included "Bowes and Church Handbook of Food Portions", "USDA Food Buying Planning Guide", "Meat and Dairy Council Bulletins (of new products and cookbooks)", "books on fast food

nutrient composition and 'health foods'", "information from trade associations".

Of the formats previously listed, "USDA Handbook #8 (or current revised edition", "reference books made available by the food manufacturer(s)", and "text reference books used in your educational courses", all correlation significantly with practice variables, because they provide the dietitians with specific product information (i.e., nutrient analyses per serving). In contrast, the "USDA Dietary Guidelines (or other food guides)" correlated significantly with dietitians, who were members of a nutrition education society. This particular format is associated more with education, especially of the public, whereas the former formats are more technical tools geared for and used by nutrition professionals. Other factors to be noted, regarding formats, were the recommendations made by the dietitians, for government and industry assistance in utilizing nutrition labeling information. In general, they wanted public education and social services (i.e., "large print handouts for senior citizens"), as well as protection ("increased labeling", and "development of national nutrition policy") and scientific information ("bioavailability analyses of foods", and "nutrient information on commodities") from the government. Their suggestions for industry were for more information on specific products that they manufactured ("standardized serving sizes", "how their product fits into different types of diets", "best ways to prepare their products for optimal retention of nutrients", "labeling information on #10 cans and cases of food"), and promotional materials to make consumers aware of good nutrition.

When the dietitians were asked if the government should allow

health or disease-related truthful claims on the food label, the majority of them replied "yes", regardless of the highest degree they had obtained. Those who had gone the "traineeship", "master's plus work experience", "internship", and "years of experience" routes to ADA membership, favored this proposition, but the dietitians who had gone the "CUP" or "three-year preplanned experience" route opposed it. The majority of "ASHFSA members", another significant correlated variate to the question, also said "yes". Presently there exists regulatory problems with implementation of this proposition. A food can be deemed as "misbranded" if its' labeling implies that the food, because of the presence or absence of certain dietary properties, is effective in the prevention or cure of any disease, or symptoms (GSA, 1981a).

In answer to the question of whether food labels should tell consumers about specific substances not in the product, the majority of dietitians said "yes", regardless of whether they were a part- or full-time employee. A majority of the youngest dietitians and those who had held the least number of previous positions also favored this proposition. This question also relates to the question involving the declaration of mandatory nutrients, present in quantities less than two percent of the U.S. RDA per serving. The ultimate question being, how flexible should the government's nutrition labeling policy be (Fed. Reg., 1979)?

Finally, the preferred method of providing nutrition labeling information for standard products was "calculation of all materials put into the product ('recipe method') by the manufacturer". Significant correlations with this method were indicated by "ASPEN and SNE members". This whole area of debate, regarding type of analysis, when analysis of the product should be done, and who should be responsible, revolves

around the proposed establishment of a national nutrient-data bank (Fed. Reg., 1979; Food Chem. News, 1980c).

When and Where Labeling Information Is Most Helpful

The dietitians surveyed found nutrition labeling information useful when they were "writing menus", "developing food specifications for vendors/brokers", and "when actually making purchasing decisions". The significant variate "ASFSA member" correlated with the first two times, indicating the concern SFS dietitians have with meeting nutrient quotas in their meal planning. "Count", "cost", and "drained weight" information, that was considered "very useful" in food bid specifications, correlated with "when actually making purchasing decisions".

The majority of dietitians, regardless of age, felt they had "a lot of impact" on "developing food bid specifications" - the "5 or more age group" felt the strongest about this. The significant variate "ASFSA member" also correlated highly with "a lot of impact". Dietitians who thought information on "cost", "count", "color", and "drained weight" were "very useful" in food bid specifications, also though they had "a lot of impact" in this area. The dietitians, regardless of age, felt they had "a lot of impact" on "determining amounts of various foods to be purchased" - the youngest dietitians felt the strongest about this. Significant variates that correlated with this practice were: "full-time employees"; "master's degree in dietetics and/or food and nutrition"; all the forms of government subsidies received; the majority of dietitians who administered the reimbursable meal. Interestingly, the majority of RDs felt they had "a lot of impact", while the majority of

non-RDs felt they only had "some impact" in this area. All of the dietitians felt they had "a lot of impact", except those who had gone the "three-year preplanned experience route". The majority of dietitians, regardless of the number of previous positions they had held, and whether they worked in a "profit" or "nonprofit" organization, felt they had " a lot of impact" on "determining specific brands of various foods to be purchased". The majority of "SFS, CUF, and HCDS members" felt they had "a lot of impact", but the majority of "DIBI members" only "some impact" in this area. The significant variate "ASFSA member" also correlated highly with "a lot of impact" in this area.

Why Nutrition Labeling Is Important

The majority of dietitians felt that nutrition labeling should be focused on aiding consumers in making product comparisons, and this correlated with those that thought "cost" information was "very useful" in food bid specifications. These dietitians also felt that nutrition information should be focused on facilitating total dietary planning and evaluation, which correlated highly with the variate "master's degree in dietetics and/or food and nutrition". The only significant variates to oppose this purpose were "master's degree in food science" and the one dietitian who had gone the "years of experience" route, to ADA membership. In contrast to the above answers, the FDA found that shoppers were divided on whether they would prefer to use nutrition labeling as a shopping aid - or as an aid in planning and evaluating diets at home. More of the shoppers said they would prefer help in getting the best nutritional buys, then said they would use the information at home (U.S. DHEW, 1975).

The majority of dietitians felt that nutrition labeling should contain information on proper handling and preparation of foods for optimal retention of nutrition quality, regardless whether they worked in a "profit" or "nonprofit" organization. There was a high correlation between "master's degree in education/home economics education" and the follwing: "nutritional qualities" information that was ranked as "very useful" in food bid specifications; and those dietitians that said they would use the information on proper handling and preparation of foods, as an educational tool for their production employees.

Evaluation of Conceptual Framework

The researcher proposed that there were two general types of beliefs, held by consumers, that influence their attitude(s) toward utilizing nutrition labeling information. These were beliefs about the consequences of utilizing nutrition labeling information, and the beliefs about what behavior is expected of them. Since the researcher assumed that dietitians would experience significantly higher pressure to comply with expected behaviors, the former belief became the important one to examine.

The researcher found that the majority of dietitians thought nutrition labeling information should be focused on facilitating total dietary planning and evaluation, as well as aiding consumers in making product comparisons that enabled them to get the best nutritional buys. The researcher believed that these beliefs about nutrition labeling would involve the positive effect(s) of increased health, but also entail the negative effect(s) of increased costs - due to compliance costs and the increased need for consumer education. The positive

effect(s) were confirmed by the majority of dietitians favoring health or disease-related truthful claims on the food label, and claims about specific substances not in the product. Both of these types of claims were strongly related to nutrients and/or health problems that were considered top priority by the dietitians (obesity/overweight, diabetes, heart/coronary disease, hypertension, and generally poor/unbalanced diets). The negative effects, of needed consumer education, influenced the dietitians choice of displaying information about sugars.

Since it had been purported that a person's attitude toward an object is based on his(her) salient beliefs about that object (Fishbein and Ajzen, 1975), it followed that the dietitians' attitudes should reflect their beliefs. The researcher confirmed their positive attitude(s) toward nutrition labeling, through the many significant correlations found between the predominate diet-related health problems, and the "very useful" nutrients. These correlations were, in turn, confirmed by the majority of dietitians that favored labeling information that consumers get too much of. The researcher believes that the dietitians' attitude toward displaying carbohydrate, sugars, and micronutrient information were influenced by their perception of the average consumers' present level of nutrition education, and the need for more education to implement some of the methods.

The researcher feels that, due to the numerous significant correlations between the dietitians' goals for nutrition labeling and their practices, the dietitians actually maintain a high degree of intention(s) toward implementation of nutrition labeling information into their professional meal planning and procuring. Thus, confirming their actual practices, since Fishbein and Ajzen (1975) purport that

specific behavior(s) usually cannot be predicted from knowledge of the person's attitude toward that object, but are determined by the person's intention to perform that behavior.

The reinforcement effects, of behaviors/practices on beliefs and attitudes, should be higher for dietitians in management, because of their knowledge about preventive medicine, and practical application of procuring foods and planning meals. This was evidenced by the fact that they favored labeling claims about health problems, and specific substances not in the product. It is on these two questions that they differed highly with the results of the Heimbach and Stokes survey (1981). The dietitians in this survey also differed, with the 1981 and the 1978 survey done by Heimbach and Stokes (1981, 1979), in their arrangement of nutrient priorities and diet-related health problems. Thus, the researcher purports that the level of nutrition knowledge is indicative of, and sufficient enough, to change the level of practice, unlike earlier study findings (Peterson and Kies, 1972; Schwarts, 1975; Carruth and Anderson, 1977). It has been said that the government hesitates to phrase health or disease-related truthful claims without being misleading, because of existing controversies about diet-disease relationships, and the belief that it is the total daily diet, not individual food items, that determine one's nutritional health (Forbes, 1978). The researcher purports that her findings support the need to educate consumers about nutrition, and focus nutrition labeling on facilitating total dietary planning and evaluation. Once the consumers understand the basics of nutrition, they could utilize the labeling information better and would not be as subject to misleading claims.

Other implications from this study are the confirmed interests in

calories and the macronutrients (fat, polyunsaturated and saturated fat, cholesterol, protein, and carbohydrates). The inclusion of certain micronutrients (sodium, iron, potassium, vitamin C, and calcium) in the nutrients considered most important by the dietitians (for consumers' use and their own use), supports the need for this information on the label. Since these dietitians favored label claims about specific substances not in the product, the question involving declaration of mandatory nutrients present, in quantities less than two percent of the U.S. RDA, might be divided into a macronutrient and micronutrient question. When mandatory macronutrients, and specific, high priority micronutrients are present in quantities less than two percent of the U.S. RDA, it should be noted on the label. The remaining micronutrients present in less than two percent of the U.S. RDA would not have to be noted. Government and industry should look at expressing micronutrient information as "measuring units/serving", since it might be better understood and utilized by consumers, and a number of the priority nutrients listed by all of the recent surveys have no U.S. RDAs established (i.e., sodium, carbohydrates, potassium). The increased use of pie charts, as a mode of nutrient data presentation, would also seem to be helpful to consumers - accompanied by a statement of measured units on the label.

As for enforcement and compliance aspects of nutrition labeling, cost factors were noted, and influenced the favoring of "representative" values vs. actual analytical values, and the "recipe method" vs. analysis of the "as used" product. Overall, though, dietitians would like to see more nutrition labeling, but not many mentioned actually making labeling mandatory. Thus, legislating discretionary powers to the USDA

and FDA would seem to be the preferred method of enforcement.

Dietitians would like more posters and information pamphlets from government and industry, as well as the inclusion of information on the proper handling and preparation of food(s) for optimal retention of nutrition quality, on labels. They also stress that any information developed for the public should be easy to read and understand. It was also suggested by a number of dietitians, that the government needs to establish education programs for the public, and utilize the media to give qualified nutrition experts more exposure to the public. Industry should investigate the development of promotional materials with nutrition information, as well as placing some nutrition information on #10 cans and cases of food.

Recommendations

In evaluating the present study, the researcher would recommend the following: a larger number of subjects; and shortening the survey by elimination of questions about type of food service, daily meal count, annual food budget, and the different promotional services the dietitians use now, would use, and would not use. The researcher would also reduce the number of hypotheses and eliminate the institutional variates in future analysis.

Based on the results of this study, the researcher recommends that further studies be done to evaluate the level of knowledge and practice relationships of other dietitians and nutrition professionals. If the FDA and USDA are going to propose regulations that would define the terms "low" or "reduced", in connection with sodium, fiber, cholesterol, and fats, then levels need to be determined for these definitions.

Similarily, research needs to be done on who, and how will "trigger levels" (thresholds for potential of inferior foods) be set, and whether they should be levels for added nutrients, or the total level of nutrients to be present. The whole area of "medical foods" needs to be examined more closely, and standardized serving sizes need to be determined and established. Ultimately, criterion for development of a national nutrition policy also need to be determined and implemented.

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APPENDIXES

APPENDIX A

COMMUNIQUÉ TO REVIEW PANEL EXPERTS

Oklahoma State University

Department of Food, Nutrition and Institution Administration

STILLWATER, OKLAHOMA 74074
(405) 624-5039

TO: MY REVIEW PANEL EXPERTS

FROM: SHEILA A. CONROY, R. D.

I have developed the accompanying survey to be the research tool for my thesis entitled, "Nutritional Labeling Practices and Attitudes of Dietitians in Management." My survey group will consist of dietitians who are members of the ADA management practice groups: School Food Service; College and University Foodservice; ADA Members with Management Responsibilities in Health Care Delivery Systems; and Dietitians in Business and Industry.

I believe that these subjects can provide the heretofore untapped knowledge of educated nutrition professionals, procuring large quantities of food for captive audiences. To my knowledge, no nutrition labeling surveys have ever been directed toward institutional buyers to date. Thus, in consultation with Dr. Ray Stokes, Director, Division of Consumer Studies, Bureau of Foods, Food and Drug Administration, I have adapted numerous of my survey questions from the "FDA 1978 Consumer Food Labeling Survey", and its recent subsurvey given to members of the American Institute of Nutrition (AIN), food manufacturers and a national sample of consumer representatives.

I would appreciate your reaction(s) to my survey - its clarity, wording, length, etc. There will of course be an explanatory cover letter sent along with the surveys to all the dietitians. I thank you for your cooperation and assistance in this endeavor.

APPENDIX B

LETTERS AND RELEASE FORMS TO ADA HEADQUARTERS AND MANAGEMENT PRACTICE GROUP CHAIRPERSONS

Oklahoma State University

Department of Food, Nutrition and Institution Administration

STILLWATER, OKLAHOMA 74074
(405) 624-5039

Karen Lechowich, R. D.
Coordinator of Council on Practice
The American Dietetic Assoc.
430 North Michigan Avenue
Chicago, IL 60611

Dear Karen:

Enclosed are copies of the letters and release forms I have sent to Jeanne Huiras, Ruby Puckett, Joanne Styer and Scott Frear, in regard to our phone conversation this morning. Stamped/addressed envelopes, to you, were included in hopes they will act promptly!

Once you receive the releases, please forward the complete membership mailing labels of the respective management practice groups. If it is agreeable with you to bill me, we can handle payment that way.

I would appreciate an estimate of the mailing labels, as you suggested, and can be reached at (405) 377-5055. I know you are extremely busy with the upcoming ADA national conference, and I deeply appreciate your assistance and understanding.

Sincerely,

Sheila A. Conroy, R. D.

Oklahoma State University

Department of Food, Nutrition and Institution Administration

STILLWATER, OKLAHOMA 74074
(405) 624-5039

Jeanne M. Huiras, R. D.
13815 Ella Lee Lane
Houston, TX 77077

Dear Ms. Huiras:

I have just completed a seven month fellowship with the National Nutrition Consortium, Inc. in Washington, D. C., and returned to Oklahoma State University to conduct research for my thesis. This will complete the requirements for my MS degree in Food Service Systems Management.

My proposed thesis topic is "Nutritional Labeling Practices and Attitudes of Dietitians in Management". I believe the ADA management practice groups (School Food Service, College and University Foodservice, ADA Members with Management Responsibilities in Health Care Delivery Systems, Dietitians in Business and Industry), can provide the heretofore untapped knowledge of educated nutrition professionals, procuring large quantities of food for captive audiences. As a dietitian in management actively interested in the future legislation/regulation(s), involving nutritional labeling, nutrient-data bank, etc., I am very interested in obtaining information about the current practices and attitudes of dietitians in management pertaining to nutrition labeling information.

To my knowledge, no nutrition labeling surveys have ever been directed toward institutional buyers to date. Thus, in consultation with Dr. Ray Stokes, Director, Division of Consumer Studies, Bureau of Foods, Food and Drug Administration, I have adapted numerous of my survey questions from the "FDA 1978 Consumer Food Labeling Survey", and its recent subsurvey given to members of the American Institute of Nutrition (AIN), food manufacturers and a national sample of consumer representatives.

Permission has been obtained from Karen Lechowich, R. D., Coordinator of Council on Practice at ADA headquarters, to contact you and request permission from you for the Data Processing Dept. at headquarters to sell your updated membership mailing labels to me as soon as they're available. If you would please sign the enclosed release form, and sent it to Karen right away, it will assure that headquarters will mail the labels to me as soon as possible. Please call me collect at (405) 377-5055 if you have any questions. Thank you for your assistance and cooperation.

Sincerely,

Sheila A. Conroy, R. D.
O.S.U. Graduate Assistant

Approved by adviser 9/18/81

Lea Ebro, Ph.D., R. D.

As chairperson of the management practice group Dietitians in Business and Industry, I grant permission for ADA headquarters to release our membership's mailing labels to Sheila A. Conroy, R. D. These labels are to be used for the sole purpose of conducting a survey to research the nutrition labeling practices and attitudes of dietitians in management.

_____

Jeanne M. Huiras, R. D.

Oklahoma State University

Department of Food, Nutrition and Institution Administration

STILLWATER, OKLAHOMA 74074
(405) 624-5039

Ruby Puckett, R. D.
Director, Food & Nutrition Services
Shands Teaching Hospital & Clinic
Box J-325
Gainsville, FL 32610

Dear Mr. Puckett:

I have just completed a seven month fellowship with the National Nutrition Consortium, Inc. in Washington, D. C., and returned to Oklahoma State University to conduct research for my thesis. This will complete the requirements for my MS degree in Food Service Systems Management.

My proposed thesis topic is "Nutritional Labeling Practices and Attitudes of Dietitians in Management". I believe the ADA management practice groups (School Food Service, College and University Food-service, ADA Members with Management Responsibilities in Health Care Delivery Systems, Dietitians in Business and Industry) can provide the heretofore untapped knowledge of educated nutrition professionals, procuring large quantities of food for captive audiences. As a dietitian in management actively interested in the future legislation/regulation(s) involving nutritional labeling, nutrient-data bank, etc., I am very interested in obtaining information about the current practices and attitudes of dietitians in management pertaining to nutrition labeling information.

To my knowledge, no nutrition labeling surveys have ever been directed toward institutional buyers to date. Thus, in consultation with Dr. Ray Stokes, Director, Division of Consumer Studies, Bureau of Foods, Food and Drug Administration, I have adapted numerous of my survey questions from the "FDA 1978 Consumer Food Labeling Survey", and its recent subsurvey given to members of the American Institute of Nutrition (AIN), food manufacturers and a national sample of consumer representatives.

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Sincerely,

Sheila A. Conroy, R. D.
O.S.U. Graduate Assistant

Approved by adviser 9/4/81

Lea Ebro, Ph.D., R. D.

As chairperson of the management practice group ADA Members with Management Responsibilities in Health Care Delivery Systems, I grant permission for ADA headquarters to release our membership's mailing labels to Sheila A. Conroy, R. D. These labels are to be used for the sole purpose of conducting a survey to research the nutrition labeling practices and attitudes of dietitians in management.

_____

Ruby Puckett, R. D.

Oklahoma State University

Department of Food, Nutrition and Institution Administration

STILLWATER, OKLAHOMA 74074
(405) 624-5039

Scott Frear, R. D.
Asst. Director of Foodservice
Central Michigan University
Mr. Pleasant, MI 40859

Dear Mr. Frear:

I have just completed a seven month fellowship with the National Nutrition Consortium, Inc. in Washington, D. C., and returned to Oklahoma State University to conduct research for my thesis. This will complete the requirements for my MS degree in Food Service Systems Management.

My proposed thesis topic is "Nutritional Labeling Practices and Attitudes of Dietitians in Management". I believe the ADA management practice groups (School Food Service, College and University Foodservice, ADA Members with Management Responsibilities in Health Care Delivery Systems, Dietitians in Business and Industry), can provide the heretofore untapped knowledge of educated nutrition professionals, procuring large quantities of food for captive audiences. As a dietitian in management actively interested in the future legislation/regulation(s), involving nutritional labeling, nutrient-data bank, etc., I am very interested in obtaining information about the current practices and attitudes of dietitians in management pertaining to nutrition labeling information.

To my knowledge, no nutrition labeling surveys have ever been directed toward institutional buyers to date. Thus, in consultation with Dr. Ray Stokes, Director, Division of Consumer Studies, Bureau of Foods, Food and Drug Administration, I have adapted numerous of my survey questions from the "FDA 1978 Consumer Food Labeling Survey", and its recent subsurvey given to members of the American Institute of Nutrition (AIN), food manufacturers and a national sample of consumer representatives.

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Sincerely,

Sheila A. Conroy, R. D.
O.S.U. Graduate Assistant

Approved by adviser 9/4/81

Lea Ebro, Ph.D., R. D.

As chairperson of the management practice group Dietitians in College and University Foodservice, I grant permission for ADA headquarters to release our membership's mailing labels to Sheila A. Conroy, R. D. These labels are to be used for the sole purpose of conducting a survey to research the nutrition labeling practices and attitudes of dietitians in management.

_____

Scott Frear, R. D.

Oklahoma State University

Department of Food, Nutrition and Institution Administration

STILLWATER, OKLAHOMA 74074
(405) 624-5039

Joanne Styer, R. D.
Director, Foodservice Division
Montgomery County Public Schools
850 Hangerford Drive
Rockville, MD 20850

Dear Ms. Styer:

I have just completed a seven month fellowship with the National Nutrition Consortium, Inc. in Washington, D. C., and returned to Oklahoma State University to conduct research for my thesis. This will complete the requirements for my MS degree in Food Service Systems Management.

My proposed thesis topic is "Nutritional Labeling Practices and Attitudes of Dietitians in Management". I believe the ADA management practice groups (School Food Service, College and University Foodservice, ADA Members with Management Responsibilities in Health Care Delivery Systems, Dietitians in Business and Industry) can provide the heretofore untapped knowledge of educated nutrition professionals, procuring large quantities of food for captive audiences. As a dietitian in management actively interested in the future legislation/regulation(s) involving nutritional labeling, nutrient-data bank, etc., I am very interested in obtaining information about the current practices and attitudes of dietitians in management pertaining to nutrition labeling information.

To my knowledge, no nutrition labeling surveys have ever been directed toward institutional buyers to date. Thus, in consultation with Dr. Ray Stokes, Director, Division of Consumer Studies, Bureau of Foods, Food and Drug Administration, I have adapted numerous of my survey questions from the "FDA 1978 Consumer Food Labeling Survey", and its recent subsurvey given to members of the American Institute of Nutrition (AIN), food manufacturers and a national sample of consumer representatives.

Permission has been obtained from Karen Lechowich, R. D., Coordinator of Council on Practice at ADA headquarters, to contact you and request permission from you for the Data Processing Dept. at headquarters to sell your updated membership mailing labels to me as soon as they're available. If you would please sign the enclosed release form, and sent it to Karen right away, it will assure that headquarters will mail the labels to me September 15th. Please call me collect at (405) 377-5055 if you have any questions. Thank you for your assistance and cooperation.

Sincerely,

Sheila A. Conroy, R. D.
O.S.U. Graduate Assistant

Approved by adviser 9/4/81

Lea Ebro, Ph.D., R. D.

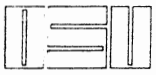
As chairperson of the management practice group Dietitians in School Food Service, I grant permission for ADA headquarters to release our membership's mailing labels to Sheila A. Conroy, R. D. These labels are to be used for the sole purpose of conducting a survey to research the nutrition labeling practices and attitudes of dietitians in management.

_____

Joanne Styer, R. D.

APPENDIX C

QUESTIONNAIRES: COLLEGE AND UNIVERSITY FOODSERVICE, DIETITIANS IN BUSINESS AND INDUSTRY, ADA MEMBERS WITH MANAGEMENT RESPONSIBILITIES IN HEALTH CARE DELIVERY SYSTEMS



Oklahoma State University

Department of Food, Nutrition and Institution Administration

STILLWATER, OKLAHOMA 74074
(405) 624-5039

October 6, 1981

Dear Colleague:

I have developed the accompanying survey as the research tool for my thesis entitled, "Nutritional Labeling Practices and Attitudes of Dietitians in Management". Your name was randomly selected from the membership mailing list of the ADA management practice groups. Permission to do this was secured from your respective management practice group chairperson and Karen Lechowich, R. D., Coordinator of Council on Practice at ADA headquarters.

I believe that memebers of the ADA management practice groups can provide the heretofore untapped knowledge of educated nutrition professionals, procuring large quantities of food for captive audiences. As a dietitian in management actively interested in the future legislation/regulation(s)' involving nutritional labeling, nutrient-data bank, etc., I am very interested in obtaining information about the current practices and attitudes of dietitians in management, pertaining to nutrition labeling information.

To my knowledge, no nutrition labeling surveys have ever been directed toward institutional buyers to date. Thus, in consultation with Dr. Ray Stokes, Director, Division of Consumer Studies, Bureau of Foods, Food and Drug Administration, I have adapted numerous of my survey questions from the "FDA 1978 Consumer Labeling Survey", and its recent subsurvey given to members of the American Institute of Nutrition (AIN)', food manufacturers and a national sample of consumer representatives.

You survey is coded for data collection purposes. This will enable me to tally your answers anonymously. I would be immensely grateful to you if you would complete this survey and return it to me in the enclosed, addressed, pre-paid envelope no later than October 21, 1981.

Thank you for your cooperation and assistance in this endeavor.

Sincerely,

Sheila A. Conroy, R. D.
O.S.U. Graduate Assistant

DIBI_____
CUF_____
HCDS_____

NUTRITION LABELING PRACTICES & ATTITUDES OF DIETITIANS IN MANAGEMENT

1. What is your age?
___A) 22-29 years
___B) 30-39 years
___C) 40-49 years
___D) 50 or older

2. What is your sex?
___A) Male
___B) Female

3. Are you a salaried employee, either part time or full time?
___A) Yes, part time
___B) Yes, full time
___C) No

4. How many years have you been employed in your present position?
___A) 1-3 years
___B) 4-6 years
___C) 7-9 years
___D) 10 or more years

5. How many professional positions, in the area of dietetics, have you held prior to your present position?
___A) 1-2 position
___B) 3-4 positions
___C) 5 or more positions

6. What is the highest degree that you have obtained?
___A) Bachelor's
___B) Master's
___C) Doctorate
___D) Other (Please Specify)_____

7. What was your emphasis of study in undergraduate and graduate education? (Please check (✓) the appropriate response(s).)

	Undergraduate	Graduate	
		Master's	Doctorate
A) Dietetics &/or Food & Nutrition	_____	_____	_____
B) Food Science	_____	_____	_____
C) Institution Administration	_____	_____	_____
D) Hotel & Restaurant Admin.	_____	_____	_____
E) Other (Please Specify)			
_____	_____	_____	_____

8. In which of the following professional organization(s) do you maintain membership?
___A) ADA (Are you a R.D.? Yes___ No___)
___B) AHEA
___C) AIN
___D) ASCN
___E) ASFSA
___F) ASHFSA
___G) ASPEN
___H) IFT
___I) NACUFS
___J) NRA
___K) SNE
___L) Other (Please Specify)_____

9. Through which of the following routes did you obtain your ADA membership? (Check one only.)
   ___A) Internship
   ___B) Co-ordinated undergraduate program
   ___C) Traineeship
   ___D) Three-year preplanned experience
   ___E) Master's plus work experience
   ___F) Doctorate

10. What type of institution do you work in (e.g., hospital - acute care, nursing home, etc.)? (Please Specify)_____

11. Which type of food service system best describes your operation? (Check one only.)
   ___A) Conventional Foodservice System - production and service of quality food within one foodservice operation while effectively utilizing all renewable and non-renewable resources.
   ___B) Assembly-Serve Foodservice System - food products are only procured after a considerable degree of processing; only storage, assembly, heating, and service functions are commonly done within the foodservice operation.
   ___C) Commissary Foodservice System - centralized food procurement and production functions with distribution of prepared menu items to several remote areas for final preparation and service.
   ___D) Other (Please Specify)_____

12. Do you operate on a profit or nonprofit basis?
   ___A) Yes, my institution/department operates for profit.
   ___B) No, my institution/department is not operated for profit.

13. What is your approximate daily meal count? (Please Specify)_____

14. What is your approximate annual food budget? (Please Specify)_____

15. What impact do you have in the following areas of the food procurement process in your institution? (Circle one for each area.)

	A LOT OF IMPACT	SOME IMPACT	NOT MUCH IMPACT	NO IMPACT
A) Developing food specifications	1	2	3	4
B) Determining amounts of various foods to be purchased	1	2	3	4
C) Determining specific brands of various foods to be purchased	1	2	4	4

16. What usefulness would information on the qualities of food be to you in food bid specifications? (Circle the degree of usefulness for each quality.)

	VERY USEFUL	OF SOME USE	OF LITTLE USE	DON'T KNOW ENOUGH
A) Color	1	2	3	4
B) Count	1	2	3	4
C) Cost	1	2	3	4
D) Drained Weight	1	2	3	4
E) Nutritional Qualities	1	2	3	4
F) Other (Please Specify) _____	1	3	3	4

17. Is your foodservice department contracted to a food management company?
   ___A) Yes (Please specify the company's name_____.)
   ___B) No

18. Do you conduct computerized nutrition analyses of your menus?
   ___A) Yes (Please specify the data bank you use_____.)
   ___B) No

19. At what time in your menu planning process do you consider nutrient content/information of food(s) the most? (Please rank the following in order of importance, 1 = best.)
___A) Writing menus
___B) Developing food specifications for vendors/brokers
___C) Actually making purchasing decisions
___D) Other (Please Specify)_____

20. Do you think it would be helpful for consumers to have nutrition labeling information available to them, in some form, at this time also? (Please refer to question #19.)
___A) Yes
___B) No

Which specific nutrition information do you think consumers should pay attention to on food packages (Column #1), and which do you pay attention to in your institutional procurement practices (Column #2)? (Please circle one number in each column for each nutrient.)

	COLUMN #1 - CONSUMERS				COLUMN #2 - YOU			
	VERY USEFUL	OF SOME USE	OF LITTLE OR NO USE	DON'T KNOW ENOUGH	VERY USEFUL	OF SOME USE	OF LITTLE OR NO USE	DON'T KNOW ENOUGH
21-22. Number of CALORIES per serving	1	2	3	4	1	2	3	4
23-24. Amount of PROTEIN per serving	1	2	3	4	1	2	3	4
25-26. Amount of CARBOHYDRATE per serving	1	2	3	4	1	2	3	4
27-28. Amount of carbohydrates which are SUGARS (Total disaccharides, monosaccharides & sugar alcohols)	1	2	3	4	1	2	3	4
29-30. Amount of carbohydrates which are STARCHES and other complex carbohydrates	1	2	3	4	1	2	3	4
31-32. Amount of carbohydrate which is FIBER	1	2	3	4	1	2	3	4
33-34. Amount of FAT per serving	1	2	3	4	1	2	3	4
35-36. Percent of fat which is SATURATED	1	2	3	4	1	2	3	4
37-38. Percent of fat which is POLYUNSATURATED	1	2	3	4	1	2	3	4
39-40. Amount of CHOLESTEROL per serving	1	2	3	4	1	2	3	4
41-42. Amount of VITAMIN A per serving	1	2	3	4	1	2	3	4
43-44. Amount of RIBOFLAVIN per serving	1	2	3	4	1	2	3	4
45-46. Amount of THIAMIN per serving	1	2	3	4	1	2	3	4
47-48. Amount of NIACIN per serving	1	2	3	4	1	2	3	4
49-50. Amount of VITAMIN B-6 per serving	1	2	3	4	1	2	3	4
51-52. Amount of VITAMIN B-12 per serving	1	2	3	4	1	2	3	4
53-54. Amount of VITAMIN C per serving	1	2	3	4	1	2	3	4
55-56. Amount of VITAMIN D per serving	1	2	3	4	1	2	3	4
57-58. Amount of VITAMIN E per serving	1	2	3	4	1	2	3	4
59-60. Amount of VITAMIN K per serving	1	2	3	4	1	2	3	4
61-62. Amount of PANTOTHENTIC ACID per serving	1	2	3	4	1	2	3	4
63-64. Amount of BIOTIN per serving	1	2	3	4	1	2	3	4
65-66. Amount of INOSITOL per serving	1	2	3	4	1	2	3	4
67-68. Amount of FOLACIN per serving	1	2	3	4	1	2	3	4
69-70. Amount of CHOLINE/LECITHIN per serving	1	2	3	4	1	2	3	4
71-72. Amount of IRON per serving	1	2	3	4	1	2	3	4
73-74. Amount of CALCIUM per serving	1	2	3	4	1	2	3	4
75-76. Amount of SODIUM (SALT) per serving	1	2	3	4	1	2	3	4
77-78. Amount of POTASSIUM per serving	1	2	3	4	1	2	3	4
79-80. Amount of MAGNESIUM per serving	1	2	3	4	1	2	3	4
81-82. Amount of MANGANESE per serving	1	2	3	4	1	2	3	4
83-84. Amount of MOLYBDENUM per serving	1	2	3	4	1	2	3	4
85-86. Amount of IODINE per serving	1	2	3	4	1	2	3	4
87-88. Amount of CHROMIUM per serving	1	2	3	4	1	2	3	4
89-90. Amount of COPPER per serving	1	2	3	4	1	2	3	4
91-92. Amount of PHOSPHOROUS per serving	1	2	3	4	1	2	3	4
93-94. Amount of SELENIUM per serving	1	2	3	4	1	2	3	4
95-96. Amount of ZINC per serving	1	2	3	4	1	2	3	4
97-98. Other (Please Specify)_____	1	2	3	4	1	2	3	4

99. What do you see as the most important diet-related health problems in this country? (Please list them without explanatory details and then rank them in order of importance to you, 1 = most important.)

DIET-RELATED HEALTH PROBLEMS	RANKING COLUMN
A)_____	_____
B)_____	_____
C)_____	_____
D)_____	_____
E)_____	_____

100. Do you think the Government should allow health or disease-related truthful claims - e.g., "Naturally Low in Cholesterol," to be made on the food label?
___A) No, such claims should not be allowed.
___B) Yes, health or disease-related truthful claims should be allowed. (Please specify those claims that should be permitted._____
_____
_____

101. Which type of information do you think consumers will pay most attention to, or find most helpful, if it were available on the nutrition label? (Check one only.)
___A) Amount of total digestible carbohydrates
___B) The amount of carbohydrates from sugars and starches each shown separately along with the total amount of carbohydrates, plus a separate declaration of fiber content.
___C) Another approach (Please Specify)_____
_____

102. Which of the following ways of showing information about sugars would consumers pay most attention to or find most helpful on food packages? (Check one only.)
___A) The total amount of sugars from all ingredients - both sugar naturally present in the product and sugars which have been added to the product.
___B) Just the amount of sugars which have been added to the product.
___C) Total sugars from all ingredients broken out by type of sugar - e.g., corn syrups, honey, sucrose, lactose, dextrose, etc.
___D) Another approach (Please Specify)_____
_____

103. Which of the following two broad types of nutrition information do you think would be most helpful to consumers? (Check one only.)
___A) Information relating to nutrients people sometimes get too much of, like calories, cholesterol, saturated fat, salt, or sugar.
___B) Information relating to nutrients people sometimes get too little of, like protein, vitamins, and minerals.

104. Which method of declaring the micronutrients (vitamins and minerals) on the label do you prefer? (Check one only.)
___A) Measuring units/100 GRAMS
___B) Measuring units/SERVING
___C) Measuring units/100 or 1000 KILOCALORIES
___D) Measuring units as a portion of that nutrient available in the food supply from all foods.
___E) Percentage of U.S. RDA/100 or 1000 KILOCALORIES
___F) Present percentage of U.S. RDA/SERVING
___G) Other (Please Specify)_____

How useful do you view these various modes of nutrient data presentation? (Please indicate by circling one number for each response.)

	MODE OF PRESENTATION	VERY USEFUL	OF SOME USE	OF LITTLE OR NO USE	DON'T KNOW ENOUGH
105.	Pie Chart	1	2	3	4
106.	Bar Graphs	1	2	3	4
107.	Adjectival Descriptions (e.g., IRON - GOOD SOURCE)	1	2	3	4
108.	Statement of Measured Units	1	2	3	4
109.	Other (Please Specify) _____	1	2	3	4

110. The ingredient label and nutrition label tell consumers what is in the product. From a safety or public health point of view, do you think there are any circumstances (e.g., non-iodized salt) in which it is desirable or useful for consumers to be told on the food label of specific substances not in the product? (Check one only.)
___A) No, this information would not be very useful to consumers.
___B) Yes, what is not in the product would be useful. For which particular nutrients, or in what specific circumstances, would this information be useful? (Please Specify)_____
_____
_____

111. Do you think that nutrition information should be focused on aiding consumers in making product comparison? ("Should I select this or that product?")
___A) Yes
___B) No

112. Do you think that nutrition information should be focused on facilitating total dietary planning and evaluation?
___A) Yes
___B) No

113. Which of the following methods used to provide a basis for nutritional labeling is most important to you? (Check one only.)
___A) "Representative" values based upon averages of surveys made by manufacturing companies over the years.
___B) Actual analytical values based on current testing of lots of the manufacturer's product(s).

114. Which method of providing nutrition labeling information for standard products do you prefer? (Check one only.)
___A) Calculation of all materials put into the product ("Recipe Method") by the manufacturer.
___B) Analysis of the "as used" product by the manufacturer.

How useful are the various formats of nutrition information to you in the planning/procurement of foods. (Please indicate by circling one number for each response.)

		VERY USEFUL	OF SOME USE	OF LITTLE OR NO USE	DON'T KNOW ENOUGH
115.	USDA Handbook #8 (or current revised editions)	1	2	3	4
116.	Reference books made available by the food manufacturer(s)	1	2	3	4
117.	Text reference books used in your educational courses	1	2	3	4
118.	USDA Dietary Guidelines (or other food guides)	1	2	3	4
119.	Other (Please Specify) _____	1	2	3	4

120. Should nutrition labeling contain information on proper handling and preparation of foods for optimal retention of nutritional quality?

___A) Yes
___B) No

121. If you answered "Yes" to question #120, would you use such information as an educational tool for your production employees?

___A) Yes
___B) No

Which of the following services are you currently using, would use, and/or would not use if available, to make employees and customers aware of the nutritional content of foods? (Please check one column for each response.)

	USE NOW	WOULD USE	WOULD NOT USE	
122.	_____	_____	_____	Food industry representative
123.	_____	_____	_____	Slide show
124.	_____	_____	_____	Film strip/cassette
125.	_____	_____	_____	16 mm movie
126.	_____	_____	_____	Teaching module without movie, slides, film strip, etc.
127.	_____	_____	_____	Nutritional analysis of products in reference book form
128.	_____	_____	_____	National nutrient data bank information
129.	_____	_____	_____	Tray tents (Table tents)
130.	_____	_____	_____	Posters
131.	_____	_____	_____	Articles suitable for a newsletter
132.	_____	_____	_____	Dietary Guidelines-type booklets
133.	_____	_____	_____	Placemats, napkins, or other paper items

134. How else can the following groups assist you in utilizing nutrition labeling information?

GOVERNMENT AGENCIES

INDUSTRY

APPENDIX D

SCHOOL FOOD SERVICE

SFS_____

NUTRITION LABELING PRACTICES & ATTITUDES OF DIETITIANS IN MANAGEMENT

SCHOOL FOOD SERVICE

1. What is your age?
   ___A) 22-29 years
   ___B) 30-39 years
   ___C) 40-49 years
   ___D) 50 or older

2. What is your sex?
   ___A) Male
   ___B) Female

3. Are you a salaried employee, either part time or full time?
   ___A) Yes, part time
   ___B) Yes, full time
   ___C) No

4. How many years have you been employed in your present position?
   ___A) 1-3 years
   ___B) 4-6 years
   ___C) 7-9 years
   ___D) 10 or more years

5. How many professional positions, in the area of dietetics, have you held prior to your present position?
   ___A) 1-2 position
   ___B) 3-4 positions
   ___C) 5 or more positions

6. What is the highest degree that you have obtained?
   ___A) Bachelor's
   ___B) Master's
   ___C) Doctorate
   ___D) Other (Please Specify)_____

7. What was your emphasis of study in undergraduate and graduate education? (Please check (✓) the appropriate response(s).)

	Undergraduate	Graduate	
		Master's	Doctorate
A) Dietetics &/or Food & Nutrition	_____	_____	_____
B) Food Science	_____	_____	_____
C) Institution Administration	_____	_____	_____
D) Hotel & Restaurant Admin.	_____	_____	_____
E) Other (Please Specify)			
_____	_____	_____	_____

8. In which of the following professional organization(s) do you maintain membership?
   ___A) ADA (Are you a R.D.? Yes___ No___)
   ___B) AHEA
   ___C) AIN
   ___D) ASCN
   ___E) ASFSA
   ___F) ASHFSA
   ___G) ASPEN
   ___H) IFT
   ___I) NACUFS
   ___J) NRA
   ___K) SNE
   ___L) Other (Please Specify)_____

9. Through which of the following routes did you obtain your ADA membership? (Check one only.)
___A) Internship
___B) Co-ordinated undergraduate program
___C) Traineeship
___D) Three-year preplanned experience
___E) Master's plus work experience
___F) Doctorate

10. Please circle the school grades your institution serves.
K 1 2 3 4 5 6 7 8 9 10 11 12 13

11. Which type of food service system best describes your operation? (Check one only.)
___A) Conventional Foodservice System - production and service of quality food within one foodservice operation while effectively utilizing all renewable and non-renewable resources.
___B) Assembly-Serve Foodservice System - food products are only procured after a considerable degree of processing; only storage, assembly, heating, and service functions are commonly done within the foodservice operation.
___C) Commissary Foodservice System - centralized food procurement and production functions with distribution of prepared menu items to several remote areas for final preparation and service.
___D) Other (Please Specify)_____

12. What percentage of your total food inventory is government subsidized?
___A) 0-24 percent
___B) 24-49 percent
___C) 50 percent or more

13. What is the form in which you receive the largest amount of government subsidies? (Check one only.)
___A) Commodities
___B) Financial support in lieu of commodities
___C) Other (Please Specify)

14. What programs do you administer in your institution? (Check as many as apply.)
___A) Breakfast Program
___B) Reimbursable Meal
___C) Summer Feeding Program

15. What is your approximate daily meal count: (Please Specify)_____

16. What is your approximate annual food budget? (Please Specify)_____

17. What impact do you have in the following areas of the food procurement process in your institution? (Circle one for each area.)

	A LOT OF IMPACT	SOME IMPACT	NOT MUCH IMPACT	NO IMPACT
A) Developing food specifications	1	2	3	4
B) Determining amounts of various foods to be purchased	1	2	3	4
C) Determining specific brands of various foods to be purchased	1	2	4	4

18. What usefulness would information on the qualities of food be to you in food bid specifications? (Circle the degree of usefulness for each quality.)

	VERY USEFUL	OF SOME USE	OF LITTLE USE	DON'T KNOW ENOUGH
A) Color	1	2	3	4
B) Count	1	2	3	4
C) Cost	1	2	3	4
D) Drained Weight	1	2	3	4
E) Nutritional Qualities	1	2	3	4
F) Other (Please Specify) _____	1	3	3	4

19. Is your foodservice department contracted to a food management company?
___A) Yes (Please specify the company's name_____.)
___B) No

20. Do you conduct computerized nutrition analyses of your menus?
___A) Yes (Please specify the data bank you use_____.)
___B) No

21. At what time in your menu planning process do you consider nutrient content/information of food(s) the most? (Please rank the following in order of importance, 1 = best.)
___A) Writing menus
___B) Developing food specifications for vendors/brokers
___C) Actually making purchasing decisions
___D) Other (Please Specify)_____

22. Do you think it would be helpful for consumers to have nutrition labeling information available to them, in some form, at this time also? (Please refer to question #21.)
___A) Yes
___B) No

Which specific nutrition information do you think consumers should pay attention to on food packages (Column #1), and which do you pay attention to in your institutional procurement practices (Column #2)? (Please circle one number in each column for each nutrient.)

	COLUMN #1 - CONSUMERS				COLUMN #2 - YOU			
	VERY USEFUL	OF SOME USE	OF LITTLE OR NO USE	DON'T KNOW ENOUGH	VERY USEFUL	OF SOME USE	OF LITTLE OR NO USE	DON'T KNOW ENOUGH
23-24. Number of CALORIES per serving	1	2	3	4	1	2	3	4
25-26. Amount of PROTEIN per serving	1	2	3	4	1	2	3	4
27-28. Amount of CARBOHYDRATE per serving	1	2	3	4	1	2	3	4
29-30. Amount of carbohydrates which are SUGARS (Total disaccharides, monosaccharides & sugar alcohols)	1	2	3	4	1	2	3	4
31-32. Amount of carbohydrates which are STARCHES and other complex carbohydrates	1	2	3	4	1	2	3	4
33-34. Amount of carbohydrate which is FIBER	1	2	3	4	1	2	3	4
35-36. Amount of FAT per serving	1	2	3	4	1	2	3	4
37-38. Percent of fat which is SATURATED	1	2	3	4	1	2	3	4
39-40. Percent of fat which is POLYUNSATURATED	1	2	3	4	1	2	3	4
41-42. Amount of CHOLESTEROL per serving	1	2	3	4	1	2	3	4
43-44. Amount of VITAMIN A per serving	1	2	3	4	1	2	3	4
45-46. Amount of RIBOFLAVIN per serving	1	2	3	4	1	2	3	4
47-48. Amount of THIAMIN per serving	1	2	3	4	1	2	3	4
49-50. Amount of NIACIN per serving	1	2	3	4	1	2	3	4
51-52. Amount of VITAMIN B-6 per serving	1	2	3	4	1	2	3	4
53-54. Amount of VITAMIN B-12 per serving	1	2	3	4	1	2	3	4
55-56. Amount of VITAMIN C per serving	1	2	3	4	1	2	3	4
57-58. Amount of VITAMIN D per serving	1	2	3	4	1	2	3	4
59-60. Amount of VITAMIN E per serving	1	2	3	4	1	2	3	4
61-62. Amount of VITAMIN K per serving	1	2	3	4	1	2	3	4
63-64. Amount of PANTOTHENTIC ACID per serving	1	2	3	4	1	2	3	4
65-66. Amount of BIOTIN per serving	1	2	3	4	1	2	3	4
67-68. Amount of INOSITOL per serving	1	2	3	4	1	2	3	4
69-70. Amount of FOLACIN per serving	1	2	3	4	1	2	3	4
71-72. Amount of CHOLINE/LECITHIN per serving	1	2	3	4	1	2	3	4
73-74. Amount of IRON per serving	1	2	3	4	1	2	3	4
75-76. Amount of CALCIUM per serving	1	2	3	4	1	2	3	4
77-78. Amount of SODIUM (SALT) per serving	1	2	3	4	1	2	3	4
79-80. Amount of POTASSIUM per serving	1	2	3	4	1	2	3	4
81-82. Amount of MAGNESIUM per serving	1	2	3	4	1	2	3	4
83-84. Amount of MANGANESE per serving	1	2	3	4	1	2	3	4
85-86. Amount of MOLYBDENUM per serving	1	2	3	4	1	2	3	4
87-88. Amount of IODINE per serving	1	2	3	4	1	2	3	4
89-90. Amount of CHROMIUM per serving	1	2	3	4	1	2	3	4
91-92. Amount of COPPER per serving	1	2	3	4	1	2	3	4
93-94. Amount of PHOSPHOROUS per serving	1	2	3	4	1	2	3	4
95-96. Amount of SELENIUM per serving	1	2	3	4	1	2	3	4
97-98. Amount of ZINC per serving	1	2	3	4	1	2	3	4
99-100. Other (Please Specify)_____	1	2	3	4	1	2	3	4

101. What do you see as the most important diet-related health problems in this country? (Please list them without explanatory details and then rank them in order of importance to you, 1 = most important.)

	DIET-RELATED HEALTH PROBLEMS	RANKING COLUMN
A)	_____	_____
B)	_____	_____
C)	_____	_____
D)	_____	_____
E)	_____	_____

102. Do you think the Government should allow health or disease-related truthful claims - e.g., "Naturally Low in Cholesterol," to be made on the food label?

___A) No, such claims should not be allowed.
___B) Yes, health or disease-related truthful claims should be allowed. (Please specify those claims that should be permitted._____
_____
_____

103. Which type of information do you think consumers will pay most attention to, or find most helpful, if it were available on the nutrition label? (Check one only.)

___A) Amount of total digestible carbohydrates
___B) The amount of carbohydrates from sugars and starches each shown separately along with the total amount of carbohydrates, plus a separate declaration of fiber content.
___C) Another approach (Please Specify)_____
_____

104. Which of the following ways of showing information about sugars would consumers pay most attention to or find most helpful on food packages? (Check one only.)

___A) The total amount of sugars from all ingredients - both sugar naturally present in the product and sugars which have been added to the product.
___B) Just the amount of sugars which have been added to the product.
___C) Total sugars from all ingredients broken out by type of sugar - e.g., corn syrups, honey, sucrose, lactose, dextrose, etc.
___D) Another approach (Please Specify)_____
_____

105. Which of the following two broad types of nutrition information do you think would be most helpful to consumers? (Check one only.)

___A) Information relating to nutrients people sometimes get too much of, like calories, cholesterol, saturated fat, salt, or sugar.
___B) Information relating to nutrients people sometimes get too little of, like protein, vitamins, and minerals.

106. Which method of declaring the micronutrients (vitamins and minerals) on the label do you prefer? (Check one only.)

___A) Measuring units/100 GRAMS
___B) Measuring units/SERVING
___C) Measuring units/100 or 1000 KILOCALORIES
___D) Measuring units as a portion of that nutrient available in the food supply from all foods.
___E) Percentage of U.S. RDA/100 or 1000 KILOCALORIES
___F) Present percentage of U.S. RDA/SERVING
___G) Other (Please Specify)_____

How useful do you view these various modes of nutrient data presentation? (Please indicate by circling one number for each response.)

	MODE OF PRESENTATION	VERY USEFUL	OF SOME USE	OF LITTLE OR NO USE	DON'T KNOW ENOUGH
107.	Pie Chart	1	2	3	4
108.	Bar Graphs	1	2	3	4
109.	Adjectival Descriptions (e.g., IRON - GOOD SOURCE)	1	2	3	4
110.	Statement of Measured Units	1	2	3	4
111.	Other (Please Specify) _____	1	2	3	4

112. The ingredient label and nutrition label tell consumers what is in the product. From a safety or public health point of view, do you think there are any circumstances (e.g., non-iodized salt) in which it is desirable or useful for consumers to be told on the food label of specific substances not in the product? (Check one only.)
___A) No, this information would not be very useful to consumers.
___B) Yes, what is not in the product would be useful. For which particular nutrients, or in what specific circumstances, would this information be useful? (Please Specify)_____

_____

_____

113. Do you think that nutrition information should be focused on aiding consumers in making product comparison? ("Should I select this or that product?")
___A) Yes
___B) No

114. Do you think that nutrition information should be focused on facilitating total dietary planning and evaluation?
___A) Yes
___B) No

115. Which of the following methods used to provide a basis for nutritional labeling is most important to you? (Check one only.)
___A) "Representative" values based upon averages of surveys made by manufacturing companies over the years.
___B) Actual analytical values based on current testing of lots of the manufacturer's product(s).

116. Which method of providing nutrition labeling information for standard products do you prefer? (Check one only.)
___A) Calculation of all materials put into the product ("Recipe Method") by the manufacturer.
___B) Analysis of the "as used" product by the manufacturer.

How useful are the various formats of nutrition information to you in the planning/procurement of foods. (Please indicate by circling one number for each response.)

		VERY USEFUL	OF SOME USE	OF LITTLE OR NO USE	DON'T KNOW ENOUGH
117.	USDA Handbook #8 (or current revised editions)	1	2	3	4
118.	Reference books made available by the food manufacturer(s)	1	2	3	4
119.	Text reference books used in your educational courses	1	2	3	4
120.	USDA Dietary Guidelines (or other food guides)	1	2	3	4
121.	Other (Please Specify) _____	1	2	3	4

122. Should nutrition labeling contain information on proper handling and preparation of foods for optimal retention of nutritional quality?
___A) Yes
___B) No

123. If you answered "Yes" to question #122, would you use such information as an educational tool for your production employees?
___A) Yes
___B) No

Which of the following services are you currently using, would use, and/or would not use if available, to make employees and customers aware of the nutritional content of foods? (Please check one column for each response.)

	USE NOW	WOULD USE	WOULD NOT USE	
124.	_____	_____	_____	Food industry representative
125.	_____	_____	_____	Slide show
126.	_____	_____	_____	Film strip/cassette
127.	_____	_____	_____	16 mm movie
128.	_____	_____	_____	Teaching module without movie, slides, film strip, etc.
129.	_____	_____	_____	Nutritional analysis of products in reference book form
130.	_____	_____	_____	National nutrient data bank information
131.	_____	_____	_____	Tray tents (Table tents)
132.	_____	_____	_____	Posters
133.	_____	_____	_____	Articles suitable for a newsletter
134.	_____	_____	_____	Dietary Guidelines-type booklets
135.	_____	_____	_____	Placemats, napkins, or other paper items

136. How else can the following groups assist you in utilizing nutrition labeling information?

GOVERNMENT AGENCIES

INDUSTRY

APPENDIX E

RESULTS OF PREVIOUS STUDIES

TABLE LVI

RATINGS OF UTILITY TO CONSUMERS OF NUTRITION INFORMATION[1]

Nutrient (per serving)	Total[2] Sample	AIN[2] Members	Trade Association[2] Members	"Interested[2] Consumers"	Consumers[3] in 1978	AIN in[4] 1970
Calories	94	94	92	95	87	74
Sodium (Salt)	80	81	70	95	73	55
Protein	79	78	76	87	81	81
Fat	79	80	73	88	77	69
Iron	67	70	54	75	74	70
Carbohydrates	66	62	70	80	72	48
Calcium	64	67	52	72	64	68
Cholesterol	56	55	44	80	74	35
% Polyunsaturated Fat	55	56	37	76	64	
% Saturated Fat	53	53	40	77	63	51
Amount of CHO which is sugars	53	53	39	70	75	
Vitamin C	53	53	44	67	78	70
Potassium	53	55	41	67	47	
Amount of CHO which is fiber	52	55	35	64	58	
Vitamin A	51	52	40	61	63	71
Vitamin D	45	46	37	57	62	62
Riboflavin	45	45	39	55	30	54
Thiamin	45	46	39	53	40	58
Niacin	43	43	38	53	36	49
Amount of CHO which is starches	41	43	27	54	65	
Vitamin B_6	41	41	30	56	50	37
Vitamin B_{12}	38	37	30	57	58	38
Iodine	33	35	21	46	47	47
Vitamin E	30	29	24	48	52	27
Phosphorous	29	34	16	29	28	35
Folacin	27	34	9	25	12	34
Zinc	26	30	10	31	25	
Magnesium	25	28	11	35	23	24
Vitamin K	21	20	13	37	36	
Panthothenic acid	20	22	11	28	14	
Copper	17	19	9	24	17	
Manganese	16	17	7	28	16	
Biotin	16	17	7	22	10	
Selemium	14	15	5	22	9	
Choline/Lecithin	12	12	7	24	25	
Chromium	12	13	4	20	10	
Molybdenum	11	12	6	20	10	
Inositol	11	11	6	19	9	
Mean Rating Score	41.4	42.5	31.9	52.6	45.6	NA
N	815	531	177	107	884	~824

[1]Heimbach and Stokes, 1981.

[2]Heimbach and Stokes, 1981, rating score based on the following weighting: "very useful" = 100, "of some use" = 50, "of little or no use" or "don't know enough" = 0.

[3]Heimbach and Stokes, 1979.

[4]Call and Hayes, 1970, rating score based on the following weighting: "high priority" = 100, "medium priority" = 50, "low priority" = 0.

TABLE LVII

SHOULD TRUTHFUL HEALTH OR DISEASE-RELATED CLAIMS BE PERMITTED ON FOOD LABELS?[1]

	Total Sample %	AIN Members %	Trade Association Members %	"Interested Consumers" %
No, should not be permitted	53	54	56	39
Yes, should be permitted	47	46	44	61
"Anything truthful"	11	11	12	11
Functions of ingredients	3	3	1	2
Ingredients claims:				
"any true statement of what is or is not in the food"	7	7	7	5
No/low salt/soidium	5	4	10	0
Low/Reduced calories	3	2	7	1
Low/Reduced cholesterol	3	2	6	1
High in vitamins(s)	2	2	4	0
Low in saturated fat	2	1	5	3
No/Low sugar	2	1	5	0
Other specific substances	8	7	13	7
Health relationships:				
Sodium-hypertension	5	5	6	5
Cholesterol-cardiovascular	3	3	3	6
Calories-overweight	3	4	2	0
Fats-cardiovascular	3	2	2	7
Sugar-dental caries	2	2	2	5
Sugar-overweight	1	1	1	1
Other relationships	10	10	5	20
Other responses	15	16	12	11
N	815	531	177	107

[1]Heimbach and Stokes, 1981.

TABLE LVIII

SHOULD LABELS EVER SPECIFY SUBSTANCE NOT IN THE PRODUCTS?[1,2]

	Total Sample %	AIN Members %	Trade Association Members %	"Interested Consumers" %
No, they should not	54	52	69	42
Yes, this would be useful	46	48	31	58
Sodium/Salt	12	13	9	14
Iodine in salt[3]	12	15	1	13
"Whenever the substance would be expected to be present"	11	11	6	18
Sugar/Added sugar	6	4	6	15
"In foods for special diets"	3	3	5	2
Cholesterol	3	3	2	3
Vitamins/Minerals other than iodine in salt and A or D in milk products	3	3	1	4
Vitamins A or D in milk	2	3	0	2
"When nutrients have been lost in processing"	2	2	1	2
N	815	531	177	107

[1]Includes all answers given by 2% or more of respondents.

[2]Heimbach and Stokes, 1981.

[3]Undoubtedly considerably raised by its inclusion in the question as an example.

TABLE LIX

PREFERRED GENERAL APPROACH TO NUTRITION LABELING[1]

Emphasis	Total Sample %	AIN Members %	Trade Association Members %	"Interested Consumers" %	Consumers in 1978[2] %
Things people get TOO MUCH of	65	64	62	75	64
Things people get TOO LITTLE of	19	19	23	14	31
"Both are necessary"	13	14	9	11	NA
Neither or no preference	3	3	6	0	5
N	815	531	177	107	884

[1]Heimbach and Stokes, 1981.

[2]Heimbach and Stokes, 1979.

TABLE LX

PREFERRED METHOD OF DISPLAYING CARBOHYDRATE DATA[1]

Method	Total Sample %	AIN Members %	Trade Association Members %	"Interested Consumers" %	Consumers in 1978[2] %
Total carbohydrates only	31	24	54	25	29
Total + sugars, starch and fiber	51	61	25	65	62
Other or no preference	16	15	21	10	8
N	815	531	177	107	884

[1]Heimbach and Stokes, 1981.

[2]Heimbach and Stokes, 1979.

TABLE LXI

PREFERRED METHOD OF DISPLAYING INFORMATION ABOUT SUGARS[1]

Method	Total Sample %	AIN Members %	Trade Association Members %	"Interested Consumers" %
Total sugars only	57	58	58	47
Sugars by type	12	13	6	19
Added sugars only	18	17	23	16
Added + natural + total[2]	8	7	7	14
Other or no preference	5	5	5	3
N	815	531	177	107

[1]Heimbach and Stokes, 1981.

[2]This response was not pre-coded, but many respondents wrote it in.

TABLE LXII

PREFERRED METHOD OF DISPLAYING MICRONUTRIENTS[1]

Method	Total Sample %	AIN Members %	Trade Association Members %	"Interested Consumers" %
U.S. RDA per serving	50	48	62	42
U.S. RDA per 100 or 1000 kcal	8	9	6	3
U.S. RDA per 100 grams[2]	3	2	4	3
Units per serving	17	18	12	23
Units per 100 or 1000 kcal	2	3	1	2
Units per 100 grams	11	13	10	6
Units as a portion of availability	2	1	1	7
Other method or no preference	7	6	4	13
N	815	531	177	107

[1]Heimbach and Stokes, 1981.

[2]This response was not pre-coded, but several respondents wrote it in.

TABLE LXIII

SUGGESTIONS FOR REVISING THE FOOD LABEL[1,2]

	All Respondents %	AIN Members %	Trade Association Members %	"Interested Consumers" %
Simplify food labels	39	36	49	31
Limit amount of information	11	10	16	9
Use basic food groups	9	7	12	9
Don't list micro-nutrients	5	4	6	6
Use graphs/symbols	3	4	2	3
Other simplification ideas	17	13	22	20
More consumer education	15	14	17	4
Keep costs in mind	8	6	13	1
Have book in store with details	4	3	6	1
Other reponses (each 1%)	42	46	35	43
Number responding	331	195	101	35
Percent of sample	41%	37%	57%	33%

[1]Percentages are based on the number of respondents who provided suggestions.

[2]Heimbach and Stokes, 1981.

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